

# RAILROAD GAZETTE

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## THE DETROIT RIVER TUNNEL.

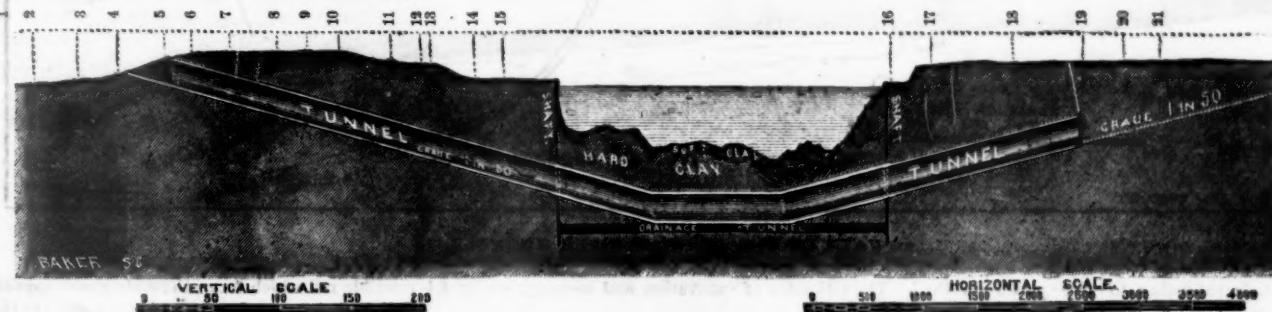
The crossing of navigable waters by railroads is one of the most difficult problems of engineering. Necessity has compelled its consideration and solution in America more frequently, perhaps, than elsewhere, both on account of the greater extent of railroads and the number and magnitude of navigable streams. It was in America, we believe, that ferry boats were first adapted to the work of transferring cars, or trains of cars, over streams and bays. The use of such ferries has ceased to be remarkable. They have been used on scores of lines, and adapted to many peculiar situations, such as rivers which fluctuate many yards in height, and bays which are al-

nued periodically, and though these periods may be long ones, yet the fact remains that the bridge constantly calls for money and increases the operating expenses of the road.

The only remaining method of crossing streams is by a tunnel or sub-way. This is comparatively a novelty in engineering, and the experience of the great pioneer of these daring engineering works, the Thames Tunnel of Brunel, has probably led engineers, and especially builders, to avoid them. It cost a great deal, and, until very lately, was of very little use. Tunnels, as river crossings, were pronounced impracticable. Men would dig and blast for miles through mountains, but to go under rivers in that way was thought hardly possible.

in extent, is increasing rapidly, and must increase for many years to come, as the yet unoccupied territories, large enough for nations, are settled and become productive. There is scarcely a moment that vessels do not pass the city of Detroit, and most of these are sailing vessels, so that it would be very difficult and expensive to build bridge a so high that they might pass under it. A plan for a bridge has been made and the parties interested have thought seriously of building it, but it would be necessary first to obtain the consent of two national legislatures in the face of the opposition of the entire lake marine.

At the present time cars are transferred between the Michigan Central and the Great Western by ferry boats,



DETROIT RIVER TUNNEL—1 3-5 MILES LONG.

1—Mich. Cent. R. R. Depot in Detroit. 2—Third st. 3—Second st. 4—First st. 5—Cass st. 6—Wayne st.

most seas, where the winds as well as the tides are obstacles to regular transit.

Bridges, of course, would naturally be first considered by the engineer. But we are considering chiefly the larger streams, which can only be bridged at great cost, and even then are more or less obstructed by the structures. The struggles which have been made concerning the right to bridge the Ohio, the Mississippi, and the Missouri are fresh in the minds of railroad men. In very few places can a bridge be so elevated above these streams as to be entirely out of the way of vessels, and as in many places these streams are a mile or more in width, the cost of these

Chicago, and its City Engineer, Mr. Ellis S. Chesbrough, have attracted the attention of the world to tunnels a second time, and at last they are looked upon with the favor due to success. The wonderful lake tunnel, which was bored under the bed of the lake for two miles, was so novel, both in conception and in purpose, as to attract universal attention and admiration. The tunnel under the river, built immediately afterwards, and entirely successful and satisfactory from the first as a roadway for ordinary travel, induced engineers to think that, after all, such works might be made useful in other situations. At least some very bold plans have been made, apparently regardless of difficulty or expense, one of which was for a tunnel between France and England, which would be about thirty miles long.

Of tunnels proposed to be actually constructed, by far

and with greater celerity, regularity and cheapness than could be expected. But the business of these roads is increasing so rapidly and the extension of the system of roads in the West which find their outlet over these lines is so great, that it has become of the first importance to reduce the time and uncertainty of transit to the minimum. Therefore a company has been organized among the proprietors of the Great Western and the Michigan Central and its connections to build a tunnel. The requisite authority has been obtained in Michigan, and a bill granting the necessary privileges is now pending in the Canadian Parliament. Some time since Mr. J. F. Joy, President of the Michigan Central Railroad Company, instructed Mr. E. S. Chesbrough, City Engineer of Chicago, to investigate the feasibility of the project and prepare plans and specifications of all the details of the work, together with estimates of its cost. Only last week Mr. Chesbrough appeared before the Parliament committee at Ottawa, and submitted the result



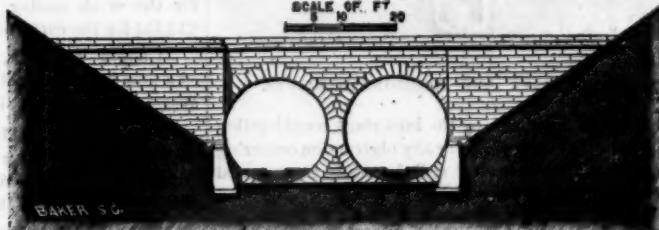
DETROIT PORTAL.

structures is very great, one of them a mile long often costing as much as fifty or sixty miles of ordinary roadway. But the practicability and the economy of such bridges has been fully demonstrated, and we have now four over the Mississippi, three over the Ohio, one over the Missouri, one over the Niagara, one over the St. Lawrence, and five or six others of similar importance now in course of construction.

But the best bridges are unsatisfactory, especially when they must have draws for passing vessels. And not alone because of the obstruction to navigation. A well made iron bridge is appropriately classed with permanent improvements. Yet the yearly expenditure for maintenance is no small sum. A large part of it must be re-

the greatest and boldest is that designed for the use of the Michigan Central and the Great Western roads in crossing the Detroit river between Detroit and the town of Windsor, which is described and illustrated herewith. The obstacles in the way of a bridge at this point are very great. The river is very wide, the banks have but moderate elevation, and the number of passing vessels during the season of navigation is hardly exceeded on any strait or river in the world. It must be borne in mind that the Detroit river is in reality a strait, connecting three of the greatest lakes in the world with others nearer the seaboard, and that through this strait all the commerce between the East and the West must pass, a commerce which is now enormous

of his investigation. The bill as originally presented chartered a company for building either a tunnel or a bridge, but the committee have since amended the bill so as to incorporate a tunnel company only. The preliminary surveys and borings in the river bed, made to the full depth of the tunnel discovered the path across the river, shown in the accompanying map, which passes the entire distance through stiff blue clay, a soil of the most favorable character for works of this kind. Occasional pockets of sand and gravel, so common in the drift formation of this section, were found, and these may produce temporary hindrances, but only such as are readily surmountable by the modern appliances of tunnel construction.



CANADA PORTAL.

The proposed line (including approaches) may be said to begin at the station of the Michigan Central Railroad, in Detroit, and will be on the surface to First street. Between First and Cass streets there will be an open cutting, but by a favorable grade of the street the line will get under cover at Cass street, and for a short distance will be under a girder covering. The rising grade of the street and the descending grade of the tunnel make it practicable to commence arching at a distance of 47 feet, which will first be an open cutting. Then a double-track tunnel or covered way will be built. At a distance of 92 feet from the Detroit portal the circular form of tunnel will begin. From that point there will be two

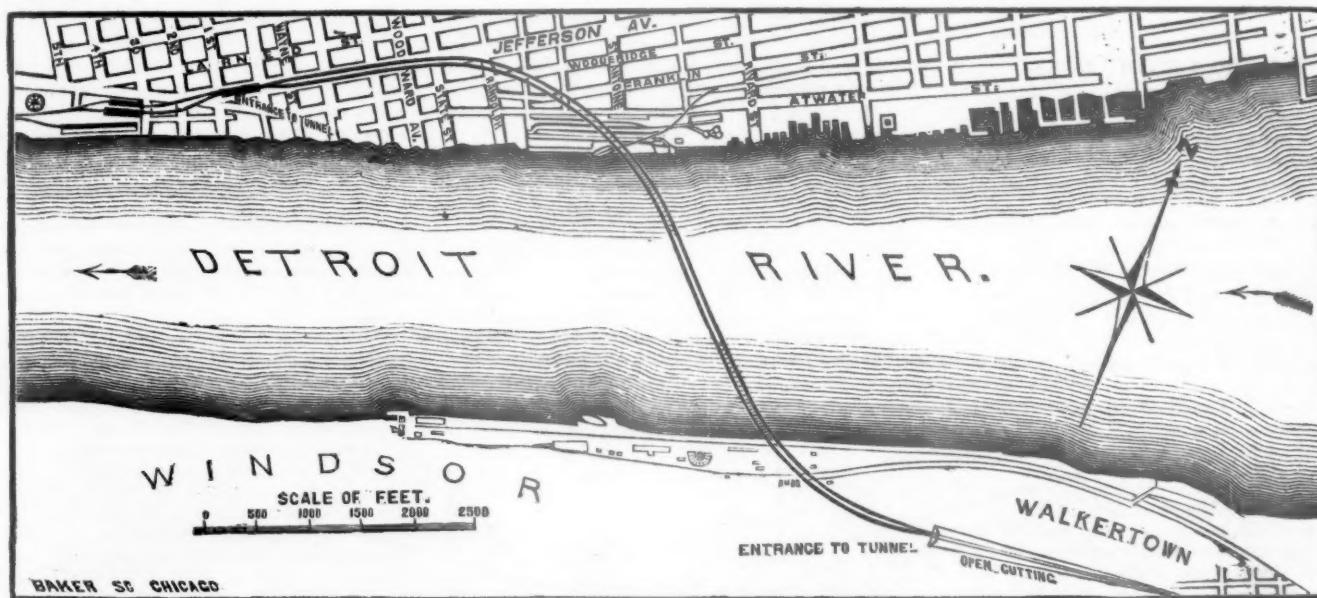
main lines and midway between them. This will be first constructed in order to drain the main tunnels while the work progresses, as well as afterward, and also to develop fully the character of the soil at the commencement of the work.

A working shaft, ten feet in interior diameter, will be sunk on each bank of the river, midway between the main tunnels, and connected with them by lateral drifts, each with an interior diameter of nine feet, as shown in the accompanying sketch. The engineer estimates that without sinking any working shafts in the river, the work can be completed within two years, allowing a margin for extra precaution where the water is deepest.

to bring the Marietta & Cincinnati up to the condition of a first-class road.

—There are now three freight lines to Montana which carry by way of the Pacific Railroad to stations in Utah and thence overland. It is thought that most of the freight will go in this way instead of by the Missouri river, as formerly.

—A bill authorizing the Great Western to change their gauge to 4 feet 8½ inches, has been reported favorably to the Dominion Parliament and is likely to pass. The road has now a third rail for the narrow gauge, and the proposed law will authorize the company to take up the



PATH OF THE DETROIT RIVER TUNNELS.

single-track tunnels extending to the portal on the Canada side, from which an open cutting will extend for about half a mile, and thence the track will run on the surface for about one-third of a mile to the junction with the Great Western Railway, two miles from the Windsor station.

The length of the tunnels from the Detroit to the Canada portal will be each 8,568 feet. The engineer has been led to propose the construction of two single-track tunnels, entirely separate, instead of one larger one sufficient to accommodate double-track, because by this plan the total amount of excavation will be considerably reduced, the liability to accident in regular traffic will be

The estimates of excavation and masonry are as follows:

	Cubic yards,
Excavation in open cutting.....	394,000
Excavation in tunnels.....	233,000
Brick masonry (exclusive of drainage tunnel).....	68,000
Stone masonry.....	3,700

The estimates for the entire cost of the tunnels and approaches, including a permanent double track, with steel rails, right of way, &c., amount to \$2,650,000. The capital proposed for the work is \$3,000,000. This amount, it is said, will be subscribed within two hours, when the charter is obtained.

As we go to press we learn that the bill incorporating the tunnel company has passed the committee of the Dominion Parliament and is likely to be carried this session. It is incorporated as the Detroit River Transit Company.

The work, when completed, will be a monument to the enterprise of the builders and the genius of the engineer, and one of the greatest accomplishments of modern engineering science.

#### LATEST RAILROAD NEWS.

—The traffic receipts of the Grand Trunk Railway for the week ending March 5 were £24,500 against £16,100 for the corresponding week of last year.

—The traffic receipts of the Great Western of Canada for the week ending March 4 were £16,483, against £13,452 for the corresponding week of last year.

—Chapin & Wells, of Chicago, have nearly completed a new iron bridge at Peoria for the Toledo, Peoria & Warsaw Railroad. It is said to be a very fine structure.

—The McKay & Aldus Locomotive Works at Boston have been closed, but a successor appears in the McKay Iron and Locomotive Works, just established at Jersey City by a member of the former firm.

—Construction trains will run over the St. Louis, Vandalia & Terre Haute Railroad through to Terre Haute, in a few days; but the road will hardly be ready for through business before the 1st of May.

—Alto, Lee county, has voted \$32,000, and Willow Creek, of the same county, \$50,000, to secure the building of the Chicago, Aurora & Iowa road this year from Aurora through Rochelle and Oregon to Foreston.

—The grading of the Chicago, Pekin & Southwestern Railroad (Marseilles, Ill., to Pekin) is progressing. It is completed through Livingston county, and the masonry for the bridge over the Vermillion is ready for the superstructure.

—The stockholders of the Marietta & Cincinnati Railroad, on the 31st ult., authorized the issue of \$3,000,000 third mortgage bonds by parties in the interest of the Baltimore & Ohio Railroad, the proceeds to be applied

outside rail which forms the wide gauge required by the original charter. It is now almost useless to the line.

—The High Bridge of the South Side Railroad of Virginia (Richmond to Lynchburg) is about to be rebuilt of wrought iron with 21 spans, each 112 feet long, at a height of 110 to 120 feet from the ground. The Fink suspension truss will be used. The new bridge will be 23 feet higher than the old one, and this increase in height will be made by means of wrought iron piers springing from the summit of the old masonry piers.

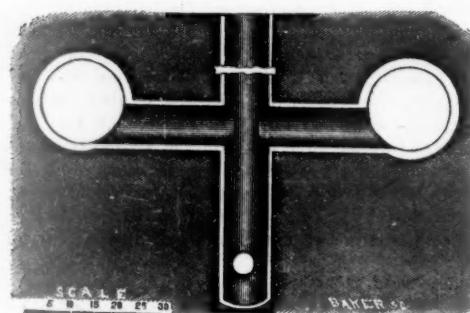
—The Baltimore Bridge Company has recently erected on the New York & Oswego Midland Railroad, across the gorge of Lyon Brook, near the town of Norwich, Chenango county, New York, the most extensive wrought iron viaduct yet constructed in this country. It is 820 feet in length, and 155 feet from the bed of the stream to the rails. The bents of this high trestle-work are placed 30 feet apart from centre to centre, upon stone pedestals.

In addition to this viaduct, the company has constructed within the past year seven other wrought iron viaducts—six on the short line from Cincinnati to Louisville, and one on the Nashville & Chattanooga, varying from 200 feet to 750 in length, and from 40 feet to 105 feet in height.

QUICK JUSTICE FOR A TICKET THIEF.—The depot at the little station of Low Moor, on the Iowa Division of the Northwestern road, was broken into on the night of the 22d ult. and several tickets were stolen. Upon discovery of the theft the following morning, the Superintendent, Mr. I. B. Howe, was promptly notified, and he thereupon telegraphed all conductors to keep a sharp lookout, and in the event of any of the tickets being presented to arrest the party. One of the missing tickets was offered for fare the same day, the telegraph was again used, and upon the arrival of the train at Marshall the person presenting the ticket was arrested. He was taken before the grand jury then in session, and the day following was convicted, and is now securely meditating upon the celerity of railway officials in general and those upon the Iowa roads in particular.

Moral.—Buy your tickets at the office and never let the fascination of a free ride delude you into thinking it is cheapest, because it isn't.

A DANGEROUS RIDE.—The Geneva Republican records a dangerous ride on the Chicago & Northwestern Railway, by John Whittaker, brakeman on the Geneva train, not long since. When the train stopped at Thatcher, he thought something was wrong with the brakes, and crawled under the cars to ascertain the difficulty. He spoke to Conductor Brosse and told him where he was going, but the latter, not hearing him, ordered his train on. It started up quick and Johnny could not get out. He threw himself on the axle of the truck, and from that position he got on a rod of iron, probably the brake-rod. He rode in that position from Thatcher to Cottage Hill, a distance of seven miles, where he was seen crawling from under the car. He was not injured, but his clothes were somewhat worn by his coming in contact with the truck.



WORKING SHAFT AND HORIZONTAL DRIFTS.

greatly lessened, and also by the important consideration that in the event of accident or any obstruction occurring in one tunnel, the other will still be ready for use and the passage of trains be not even temporarily prevented. The tunnels will be cylindrical in form and will run parallel, fifty feet apart. The interior diameter of each is eighteen feet, six inches. The shell of brick masonry will be two feet thick in all that part of the line under the bed of the river, but at each bank this will be reduced to one foot, six inches.

It is not intended to have the tunnel, at any point, within less than twenty feet of the surface of the hard clay. An examination of the engraving of the longitudinal section shows that at one point of the line the distance is considerably less than this. It is proposed to fill in this depression of the river bed with clay to a sufficient depth to insure against any possibility of accident.

The grade is 1 in 50 on each side of the river, with 1,000 feet of level line under the bed of the river.

In addition to the main tunnels, a smaller drainage tunnel, with an interior diameter of five feet, will be built, extending across the river considerably, below the

## Chicago Railroad News.

### Chicago & Northwestern.

Arrangements have been made for running Pullman hotel cars on the company's Omaha line—an improvement which will be, doubtless, good both for the company and for travelers.

The astonishing decrease in earnings for the third week of March (35 per cent.), reported elsewhere, is not so bad as it looks. Doubtless there would have been a decrease, even if all had been well. But all was ill. The snow blocked the Iowa Division more than half the week, and other lines were obstructed from one to three days.

The following changes have recently been made upon this road:

Adin Thayer, Jr., having resigned the Purchasing Agency of the Chicago & Northwestern Railway to accept a position on the New York Central, Mr. H. Bausher, Jr., is performing the duties of this important office until a successor is appointed by the Board.

Stephen A. Clark is appointed to be Agent at Mechanicsville station, Iowa Division, *vice* Roland Stevens, resigned.

J. W. Robinson to be Agent at Bertram station, Iowa Division, *vice* T. A. Clark, transferred.

O. Harris to be Agent at Inman station, Wisconsin Division, *vice* O. D. Newton, resigned.

Philip Wheat to be Agent at Dunton station, Wisconsin Division, *vice* Geo. A. Hawkes.

The following named freight conductors have recently been promoted to the responsible positions of Passenger conductors on the Divisions named:

P. S. Richards, H. Wheeler, Galena Division; C. D. Watkins, C. O. Morton, Iowa Division; E. B. Ryan, Madison Division; Fred Keyes, Kenosha Division; R. B. McRoberts, Milwaukee Division.

### Chicago, Rock Island & Pacific.

The Omaha train over this route now arrives in Chicago at 3:25 p. m. instead of 4:00 p. m., as heretofore.

On the 4th instant (Monday), a dummy train will be put on for the accommodation of suburban travel. It will make two trips daily each way between Chicago and Blue Island, passing through Washington Heights on a track laid for that purpose. It will stop at four points in Washington Heights; the station, Prospect avenue, Tracy avenue and Morgan avenue.

Hereafter, commutation tickets for three, six and twelve months to all places between Chicago and Joliet will be sold at the general ticket office to those who desire them, at low rates.

### Lake Shore & Michigan Southern.

The decrease of earnings for the third week of March, reported elsewhere, was occasioned by the snow blockade, though this road was not blockaded. But in the East, both the Erie and the New York Central were closed for some time, and at the same time several of the roads leading west and northwest from the city were obstructed. So, though trains ran regularly on the Lake Shore line, they ran light, because business could not reach it at either end.

The annual meeting of the stockholders of this company will be held in Cleveland on the 4th of May next. The transfer book will be closed on the 2d of this month.

### Pittsburgh, Fort Wayne & Chicago.

Mr. W. C. Cleland, the Western Passenger Agent, returned last Wednesday from Cleveland, where he has been resting and recruiting for a month past.

Two of the new Pullman coaches constructed at Fort Wayne, according a new and peculiar pattern, arrived Thursday in this city and were put into service. They have what might be called a semi-circular verandah at each end, which affords an admirable place to sit and view the country.

### Blue Line.

This line claims the honor of shipping the first cargo of tea across the continent. Twelve car loads arrived from San Francisco by the Pacific railroads and the Chicago & Northwestern, two were left here for sale, and nine forwarded to New York by the Great Central Route. The rates made on this tea were \$4.50 from San Francisco to New York—exceedingly low. The agreement was made when shipped from Yokohama that the cargo should reach New York within forty days. The voyage to San Francisco occupied twenty days, and the transportation thence to New York only sixteen. It is claimed that the flavor of this delicate article is preserved much better on this route, by which two passages across the tropics are avoided. We imagine that the only obstacle to a large tea traffic across the continent is a lack of return car goes at San Francisco.

### General Thomas.

All our railroads offered cars for the transportation of the remains of General Thomas and escort, on the way from San Francisco to the East; but it is understood that the route was determined upon in San Francisco before starting, by way of the Pacific roads to Omaha, the Burlington & Missouri River and the Chicago, Burlington & Quincy to Chicago, the Lake Shore & Michigan Southern to Buffalo, and the New York Central to New York.

### Personal.

Captain L. A. Pierce, the agent of the Detroit and Cleveland steamboat line, known as the "Michigan Central Line," which connects with the Michigan Central trains at Detroit, gives them a night's good rest, and lands them in Cleveland

in time to continue their journey eastward by Lake Shore trains, was in the city this week, making arrangements for the business of the coming season. He thinks the boats will be able to commence running the last of next week.

Theodore Hosmer, Ticket Agent of the Central Pacific Railroad at San Francisco, passed through the city last Tuesday on his way to the East.

### Chicago, Burlington & Quincy.

The company's agent has recently registered at Springfield bonds to the amount \$300,000 issued by towns and counties in aid of the construction of the Rushville Branch.

The Aurora Beacon gives the following account of work now under way in the car shops of this road at that place, under the superintendence of Master Car Builder W. W. Wilcox.

"Six new Pullman's—four commissary and two sleeping cars—are now receiving 'lightning' finishing strokes in the paint shop. Two passenger coaches for the Leavenworth, Lawrence & Galveston, two do. for Missouri River, Fort Scott & Gulf, and two mail and express for the same (all Kansas roads), are also being rushed rapidly towards completion. Besides work has been commenced on a whole Pullman train, consisting of one baggage, one smoking, one commissary, and two sleeping cars, to be run through together from Chicago to Omaha over the Chicago, Burlington & Quincy road and Burlington & Missouri River road, crossing the Mississippi river by the Burlington Bridge.

### The General Ticket Agents.

These are nearly all gone to New York this week to attend the meeting of the Association.

### Eastward Bound Freight.

A new tariff of rates for through freight to the East went into operation on all the lines on the 23d inst.

We give below the rates to some leading Eastern points:

Chicago to	1st Class.	2d Class.	3d Class.	4th Class.	Grain in Bulk					
					Wheat & Corn 50 bushels or over	Meal in lots of 50 bushels or over	Dressed Meat... at owner's risk	Fresh Beef & Mutton at owner's risk	Mutton at owner's risk	Cured Meats in bulk, at owner's risk
Boston .....	1.70	1.25	.90	.50	1.00	1.00	1.00	.60	.55	.55
New York .....	1.60	1.25	.85	.45	.90	.90	.90	.55	.45	.45
Albany .....	1.50	1.15	.80	.45	.90	.80	.80	.55	.45	.45
Troy .....	1.50	1.15	.80	.45	.90	.80	.80	.55	.45	.45
Schenectady .....										
Philadelphia .....										
Baltimore .....	1.50	1.15	.75	.40	.80			.50	.40	.40
Harrisburg .....	.90	.75	.45	.25	.50			.30	.25	.25
Pittsburgh .....	.85	.68	.45	.24	.45	.50	.50	.35	.34	.34
Buffalo .....	.70	.55	.40	.25	.50			.35	.25	.25
Cincinnati .....										

Freights are taken at Boston rates to most New England towns, when shipped by the car load, and to stations on the Hudson River road at New York rates, on the same conditions.

Zanesville, Steubenville, Bridgeport and Bellaire, Ohio, have the Pittsburgh rates.

Columbus has Cincinnati rates except on cured meats, which are five cents less to Columbus.

At these rates there has been a heavy eastward movement. The rates make the cost of shipping wheat in bulk to New York by rail only twenty-seven cents, and immense quantities are going forward.

### Chicago & Alton.

In pursuance of the policy announced in President Blackstone's recent annual report, there will be about twenty miles of track laid with steel rails the coming season. These will be placed between Chicago and Wilmington, where the coal traffic is very heavy. It is intended to lay a similar extent every year until the whole line is supplied with steel rails. The "John Brown" rail is ordered this year.

We give elsewhere a contribution which explains the recent decision concerning the crossing of the tracks of this road at Jacksonville by the Peoria, Pekin & Jacksonville Railroad.

### New Palace Cars.

The "Ivanhoe" and "Waverly," two of Pullman's latest which made their first trip from Chicago to New York over the Pittsburgh, Fort Wayne & Chicago and Pennsylvania Railroads last Wednesday, are finished in such elaborate style as to attract attention even among the many gorgeous coaches which have been lately turned out.

The peculiarities of construction of these cars were described somewhat at length in a February number of the *Western Railroad Gazette*, while they were building at the Fort Wayne shops.

The ends of these coaches have a semi-circular form, and a spacious "piazza," sufficient to accommodate a dozen chairs and completely enclosed by an iron railing, is substituted for the old inhospitable style of platform.

Entering the car the traveler finds himself in a circular vestibule ranged with beautifully upholstered seats and can gaze his finer sense with gazing upon \$600 worth of frescoing on the ceiling of the ornamental dome, a gorgeous silver pendant candelabra and numerous little extras about the walls, both for use and ornament, of the same burnished metal. Adjoining the vestibule is an elegant and elaborately fitted private parlor with a baggage room and closet attached and in fact with all the comforts of home—and more too. The walls, inlaid with foreign woods—ash, maple and walnut—the silver trimmings and artistic arrangement of mirrors, the rich upholstering of French moquette and the heavy Wilton carpets, together with the large double windows surmounted by semi-circular transoms, produce a dazzling general effect, at which our grandfathers would weep.

The Pittsburgh, Fort Wayne & Chicago Railway now run six of these coaches regularly on their New York trains. The others have been christened the "Ohio," "Pennsylvania," "Wasatch" and "Promontory."

### REGISTER OF EARNINGS.

SECOND WEEK OF MARCH.

St. Louis & Iron Mountain, 1870..... \$21,549  
" " 1869..... 11,399

Increase (150 per cent.)..... \$10,936  
(This road is greatly increased in length since last year.)

Toledo, Wabash & Western, 1870..... \$21,500  
" " 1869..... 80,070

Decrease (10% per cent.)..... \$8,570

THIRD WEEK OF MARCH.

Chicago & Northwestern, 1870..... \$167,157  
" " 1869..... 257,673

Decrease (35 per cent.)..... \$90,515  
Lake Shore & Michigan Southern, 1870..... \$331,763  
" " 1869..... 255,692

Decrease (9 per cent.)..... \$23,909  
Milwaukee & St. Paul, 1870..... \$69,400  
" " 1869..... 101,939

Decrease (32 per cent.)..... \$39,559  
Chicago & Alton, 1870..... \$88,674,76  
" " 1869..... 100,995,64

Decrease (12½ per cent.)..... \$13,390,88  
Michigan Central, 1870..... \$74,710,64  
" " 1869..... 90,357,47

Decrease (17½ per cent.)..... \$15,640,83

### NEW PUBLICATIONS.

CAMPBELL'S NEW ATLAS OF THE STATE OF ILLINOIS, with descriptions, Historical, Scientific and Statistical. Price \$12. R. A. Campbell, Publisher, No. 131 South Clark street, Chicago.

This is a work which should find place in every counting room and family in the State, being by far the most worthy one of the kind that has yet appeared. Its maps are clearly drawn, tastefully colored, and are on a scale large enough to show every forty-acre tract in the State. They are thirty in number, and present every railroad, river, village, town, postoffice and station in Illinois, or at least do so approximately. The valuable articles on topography, history and climatology were prepared by Col. J. W. Foster, and that on geology by A. H. Worthen, State Geologist. The agricultural and educational departments are ably treated, and the statistical portion of the book is of great value. We heartily commend the work as conscientiously undertaken and performed, with a view to making it the standard on all matters relating to the State of Illinois.

USEFUL INFORMATION FOR RAILWAY MEN. Compiled by W. G. Hamilton, Engineer. Second Edition. D. Van Nostrand, Publisher, New York.

The Ramapo Wheel & Foundry Company have lately issued a little work, entitled "Useful Information for Railway Men," compiled by W. G. Hamilton, Engineer, and published by D. Van Nostrand, New York. The book at once attracts attention and recommends itself by its unique and convenient form and elegant general finish. It was undoubtedly intended originally as an advertisement for the company, and the embodying of so many valuable formulas and recipes useful for railway men, and indeed for almost every class of persons in the world, will probably prove valuable to the advertisers and is certainly a commendable project.

The "Information" comprises some valuable formulas and rules for the construction of boilers and engines, masonry, properties of steel and iron, and the strength of materials generally.

The results of analysis of the more familiar forms of trusses, Pratt's, Whipple's, Howe's and the Suspension Bridge, are given in the form of brief, and, we fear, incomplete, working formulas. Frog angles and switches and the construction of curves also receive some attention: in fact nearly the whole ground of engineering is touched upon.

Some portions of the work, as for instance the instruction in elementary arithmetic and hygiene, might perhaps with advantage have been omitted, considering the class of readers addressed, still on the whole the book is one which all civil and mechanical engineers will want to examine, and many valuable hints may be derived from it.

PUNCHINELLO.—This new humorous paper begins its existence with the RAILROAD GAZETTE, the first number being dated April 2, 1870. The fate of *Vanity Fair*, *Mrs. Grundy*, and their comic predecessors has induced many to believe that there is no field for comic journalism in America, though we certainly have distinguished humorous writers, and their writings are more generally read than any other American literature. A country which has supported so liberally such humorists as Artemus Ward, Mark Twain and Josh Billings, ought certainly to support a humorous periodical. Perhaps the greatest obstacle is a lack of skillful artists. We have Thomas Nast and Henry L. Stephens, it is true, but, there are few others who make good caricatures and humorous sketches.

This number of *Punchinello*, however, is especially noticeable for its pictures, many of which are by Henry L. Stephens. They are not only good engravings, but good pictures, full of character and humor.

The paper is one of the handsomest now published. It is said to have the aid of half a score of our best writers, chiefly young men, of New York, and certainly if it keeps good the splendid promise of the first number, it will richly deserve success. It is published by the Punchinello Publishing Company, at No. 83 Nassau street, New York.

George W. Lee, formerly an operator in the Western Union Telegraph office at Detroit, has been appointed operator in the Atlantic & Pacific and Great Western office at the Union Stock Yards, Chicago.

## Selects.

### STREET RAILWAYS.

The essentially American institution of street railways is now being established in Europe. Copenhagen is furnished with a comprehensive system of intercommunication by street horse railways. At Paris a suburban line known as the *Chemin de Fer Americain*, from the Place de la Concord to Versailles, has been in existence since 1851, it having been established by a M. Laubat, whose intention was to introduce the system throughout Paris; and reasons of Imperial policy alone have frustrated the accomplishment of that object. In Geneva a horse railway has been working with success for many years. In Kirkhead, Liverpool and Manchester, horse railways, or "tramways" (as they are called), are in daily and successful operation. In London, after years of application and contest against prejudice and red tapeism, Parliamentary powers have already been acquired, and tramway lines are in process of being laid down at the present moment. In London a reaction has set in favor of street railways, and applications for Tramway Bills are eagerly and numerously made.

As the plans adopted in Europe present much variety, and as the systems of working tramways materially differ from those of our country, some instructive points may be gleaned from an examination of them; and we may expose many of the inconveniences arising from our own experience of them. We may lay it down as an axiom that street railways cannot compete with Metropolitan steam railways. Street railways will certainly be able to effect certain advantages that cannot be attained by Metropolitan railways; but where such are judiciously introduced, the horse railways become at once auxiliaries. This condition of the subject we believe is not fully comprehended in their introduction into London. For the absence of any Metropolitan means of street transit in London, except by stages (called there omnibuses), or hacks (cabs), and other vehicular and limited means, urged on the introduction of the splendid system of Metropolitan railways, both tunnel and overhead. Whereas in New York, notwithstanding the apparent comprehensiveness of the street railway system, the demand for a through steam track is unceasing and universal; and Albany, will, this session, be the battleground upon which may probably rest the decision for an underground railroad under Broadway. So great is the popular and monetary influence brought to bear upon the New York Arcade Railway, that its speedy introduction may now be looked for.

Street railways, in nearly all cases in this country, are a direct appropriation of the thoroughfare. It is at this point that has caused the hitherto determined opposition that their introduction has met with in Europe, and in English cities in particular, where the "Queen's highway" is guarded with scrupulous jealousy. This, added to gross mismanagement and inability, caused the failure of G. F. Train's attempt to introduce them into London in 1865. To meet this and other difficulties of the opposition, various schemes have been advocated. What is known as the Geneva Tramway is a track of flat bar rail laid at a five-foot gauge, the rail varying from four to seven inches in breadth, with its surface flush with that of the road. In the centre of the track is laid a grooved rail, whose groove is sufficiently narrow not to admit of the tires of ordinary vehicles. Cars to run on this track are furnished with simple flat-tired wheels; and when upon the track, the driver drops a small wheel or pulley into the groove of the mid-rail. The bearings of this wheel being attached to the car or omnibus, the latter is thereby retained upon the track. If the track is obstructed by the street traffic, or otherwise, the driver raises the small wheel from the groove, and diverts his car from the track, to rejoin it at pleasure. This system is in daily operation in Manchester.

Various have been the schemes devised to meet the following exigencies: a broken track, where powers have not been granted to lay it continuously over main crossings, etc.; depressions of the roadway, or other interferences with its level, by the form of rail; interferences and obstructions of the street traffic. Wheels with movable flanges, to slip into a groove-rail when on track, and to lift therefrom when about to quit the track, have been suggested. And also half-coned tires running on a flat rail, laid at a slight angle—an English invention, and perhaps the least obstructive form of rail—and many other inventions of greater or less utility must be added.

But, apparently, the difficulties of running a street railway, with a view to accommodate its passenger traffic, and at the same time respect the street traffic, is so great, that the projectors of tramways in London have resolved upon retention principle, as in America; using, however, a narrow grooved rail, and an ordinary flanged wheel. This form of tramway is that in operation at Copenhagen. At Liverpool, the tramway runs upon the quay where there is but little obstruction; an angle or square is formed, by the use of a compound rail, that is, one rail placed at right angles to the surface rail, thus forming a guide to retain the ordinary flat street-tired wheels, which the Liverpool cars or stages are furnished with, and running off the track to various routes through the city.

The street railway now being laid down in one of the main thoroughfares of the north eastern quarter of London is as follows:

The rails are laid on longitudinal sleepers of Baltic pine, four inches broad by six deep, seventeen feet long, with ends abutted. The rails in twenty-five feet lengths, are spiked on to the sleepers, which are held by iron chairs, or angle pieces at every  $4\frac{1}{2}$  feet. These chairs act as fastenings for iron ties, whose ends dove-tail into them: they brace the track together and maintain its gauge, which is set at the English railway standard of 4 ft.  $8\frac{1}{2}$  in. These ties are  $\frac{3}{8}$  by  $1\frac{1}{2}$  in. Concrete, and, where desirable, Portland cement concrete is laid for a bedding for the sleepers. The form of rail used is the breadth of the sleepers, four inches. The rail is grooved towards its inside edge to the extent of one inch, which tapers to

a depth of three quarters of an inch. The surface between the groove and the inner edge is corrugated to prevent the horses slipping. The two inches of surface between the groove and the outside edge is smooth, and is the bearing surface for the wheel-tire, whilst the groove will accommodate the flange. The ends of the rails are brought together upon a sole-plate, which is let into the sleeper, upon which the whole is spiked. The road described runs principally on a macadamized road. The track is paved with granite pitching, two rows being also laid outside and contiguous to it. Two tracks occupy  $13\frac{1}{2}$  feet of the roadway.

The form of rail described appears to us to have many advantages over the ordinary shoulder rail, for cities. We admire also the permanent character of the work just described. The style of the work is as essentially English as our own is American. With us, the ruling consideration in all such works is "the hour." In New York city our horse-car tracks are a disgrace. They are always out of repair. The obstructions and inconvenience arising from this state of affairs is intolerable. The shoulder-rail is in itself a most objectionable form of rail. A serious depression is caused by its use, and we greatly doubt, whether the advantage of casually running ordinary vehicles upon its surface is not quite outweighed by its obstructive qualities.

The old and mountainous cobbled roads of the city are giving way to a better class of pavement, which will lessen even the above quoted advantages.

Street railways, although they greatly assist the relief of otherwise crowded traffic, are exceedingly inconvenient, and therefore should be subject to inspection in the public interest. The tire-wrenching capability of New York street railways is patent to all proprietors of vehicles. To ride upon them is to be severely jolted and shocked; for the unyielding nature of a railway track offers such resistance to a fall, that the shock resulting from it is oftentimes distressing.

Perhaps the best form of rail is a four inch rail, grooved as described, laid upon longitudinal sleepers, carefully sole-plated, and the sleepers braced by transoms. All curves and cross tracks to be laid with especial care, and the whole to be laid upon a compressed and elastic material. As to the rolling stock, there is a stereotyped form of car that has been adopted, but, we fear, more in the interest of the owners of street railways than of the passengers. We can hardly believe it to be the result of experience for the combined interests of both. Firstly, there is no stated capacity; the general habit being to seat all who can be seated, and if crowded, to leave the majority, (who pay an equal amount of fare), to stand and hang on to leather loops, *humanely* provided for that purpose. Those who have not the advantage of standing room inside, can be jostled and crowded upon the front or rear platform, without any recompense as to fare. This system is an injustice to the passengers and a cruelty to the horses, while the argument that if the public does not like the accommodation it need not take advantage of it, will not hold good with companies enjoying public privileges.

The manufacture of cars, more particularly those of that veteran manufacturer, George Stephenson, of this city, are otherwise commendable, notwithstanding the fact that their accommodation is quite insufficient. The introduction of draught springs would greatly relieve the passengers. We have seen these, we think, attached to Stephenson's cars, and actually wilfully rendered useless by the insertion of a pin, or otherwise.

We think that the tendency has been to assimilate the character of street cars to that of ordinary railway cars, whereas, if they partook more of the character of stages, their accommodation would be greater. Roof seats, covered with a high awning, should be provided, as in summer such an arrangement would be particularly refreshing. The city government should prevent crowding, and more cars should be provided. In Manchester and Liverpool the cars are also omnibuses or stages, and the horses assist in the stoppage of them, though their great momentum requires the aid of other agencies. We trust that our neighbors in London will not be subjected to the inflictions which we daily suffer at the hands of street railway companies.

From practice here, and some knowledge of the conditions in London, we think that if our own system of railways were partially carried out on the long, broad, and open thoroughfares, and that an *on and off* omnibus railway plan were adopted for the winter communication (the whole being worked as auxiliary to the system of Metropolitan railways), the public would gain liberal advantages.

The abuse of horse railways in London will be more serious in its effect than here. We should be also glad to hear what are the intentions of the English companies relative to the introduction of steam on the street lines. The relief of the traffic of a commercial city such as London by street railways is, we believe, from our own observations here, greatly exaggerated as to its benefit, if there are by-streets running parallel and contiguous to the great roads. These by-streets should be furnished with street railways to relieve the traffic of the main thoroughfares.

Street railways form an intermediate system between the vehicle and the steam railway. Unfortunately, this fact is not always considered.—*The Technologist.*

### The Pacific Mail.

The San Francisco *Chronicle* intimates that the stock of this company has been forced down by a combination which includes many of its largest stockholders and directors, and gives the following account of the company's business since the opening of the Pacific Railroad:

Now as a matter of fact the Pacific Mail steamers have been well patronized ever since the opening of the Continental Railroad. The average number of passengers for each voyage has been far above the average transported by the Cunard steamers; the number varying from 250 to 600 and upwards. The freight list for much of the time has been a fair one. And in this department

of the business there really has been very little competition with the Pacific Railroad. It is to be noted further that the loss of a steamer is the opportune moment seized to bear the stock.

The route, after dropping out this steamer, is well stocked with first-class ships, with reserves for all emergencies. The business in freights and passengers is actually large. As for the high prices over the Panama Railroad, these have always been oppressive. But it has been in the power of the Mail Company to build another road, or to purchase so much of the stock of the Panama road as to profit by the high prices which are said to constitute a serious ground of complaint. These reports of withdrawal may be safely credited to the bears. But whether the roughest bears are inside of the company, or on the outside, is a question easier to be decided at a future day than now.

### Steel and Iron Rails.

Among the reports made to the Massachusetts Railroad Commissioners on the comparative value of steel and iron rails is the following by George Stark, Manager of the Boston & Lowell Railroad. Mr. Stark, it will be seen, is decidedly in favor of iron. He begins, however, by confessing that he has had little experience with steel, and adds:

"It may be proper for me to state, however, that the question of their introduction as a proposed measure of safety and economy has received a good deal of my most careful attention, and that, after personally examining their manufacture and use, both in this country and in Europe, I am not able to see that the public safety, or the economic interests of the road under my charge, would, at present, be promoted by exchanging our iron rails for steel. In the present state of the art, the manufacture of steel seems to be liable to quite as much imperfection as the manufacture of iron. Indeed, it requires a much higher degree of skill to produce a safely tempered steel rail than to produce safe iron one. And we find consequently, that the most rigid inspection must be made of the steel, after its final working, throwing out every bar that shows the slightest flaw or imperfection, or it is sure to afterwards break in the track. Such slight imperfections, fatal to steel, are comparatively harmless to iron. Again, good steel can only be made from peculiar and valuable varieties of pig iron. The temptation to the manufacturers to make use of inferior material, at a great saving in cost of production, thus throwing upon the market an unsafe product, is greater than in the manufacture of iron, because the margin of profit is much larger. The actual cost of making steel by the Bessemer process is less than the cost of making good iron from the same pig. Yet we are required to pay, in royalty and profit, about 50 per cent. more for the steel, in the first instance, and to throw it away when too much worn for use, instead of re-rolling it as we do our iron rails, no process having yet been discovered by which the steel can be re-manufactured. Great care has been taken on the Boston & Lowell road to obtain iron rails of the best possible quality. They have been manufactured or re-rolled under specifications drawn to conform, as nearly as might be, to methods in use thirty years ago, when rails were made that exhibit some samples in wear from that time down to the present day. As a result, we are prepared to show, by exact record, that, under the heavy traffic between Boston & Lowell, our rails are giving us more than ten years' service, and amply repay the extra cost and care put into their manufacture. So long as we may be able to keep up our standard of quality for iron rails, without great extra cost, and until steel can be obtained of unquestioned safety, at reasonable price, with a market for the worn material, we shall be disposed to adhere to iron."

### Northwestern Union Packet Line.

A meeting of the company was held in Chicago recently, at which the following roster of officers was determined upon:

Alexander Mitchell—Commander, J. T. West; First Clerk, John Shether; Second Clerk, W. H. Barnes. Belle of LaCrosse—Not Made.

Phil Sheridan—Commander, E. V. Holcombe; First Clerk, Walter Dill; Second Clerk, Hank Tyrrell.

Northwestern—Commander, T. L. Davidson; First Clerk, F. E. Snow; Second Clerk, O. H. P. Cooley.

City of St. Paul—Commander, J. H. Reaney; First Clerk, U. M. Davidson; Second Clerk, E. D. Young.

Tom Jasper—Commander, R. H. Riley; First Clerk, Wm. M. Brown; Second Clerk, not named.

Milwaukee—Commander, Isaac Bryson; First Clerk, Chas P. Hovey; Second Clerk, E. Fuller.

War Eagle—Commander, Tom Cushing; First Clerk E. A. Burrage; Second Clerk, S. M. Whitney.

Keokuk—Commander, Sam Painter; First Clerk, Daniel Garin; Second Clerk, Simon Soncerbox.

The arrangements between this and the Northern Line are substantially the same as last season, this being the second year of the combination, which is to last, under a penalty for any violation, of fifty thousand dollars, for a term of five years. Boats of each line will leave St. Louis on alternate days. The Northwestern Company will place three splendid new steamers in the line, each with a carrying capacity of about 1,000 tons. The new boats are the Alexander Mitchell, the Belle of La Crosse, and the Northwestern. The Phil. Sheridan has received a new boiler, and has been generally repaired at Cincinnati. The running arrangements of this line are as follows: Between St. Louis and St. Paul: The Alexander Mitchell, Belle of Lacrosse, Northwestern, Phil. Sheridan and City of St. Paul. Between Dubuque and St. Paul: The Milwaukee and War Eagle. Between LaCrosse and Winona: The Keokuk. Between St. Louis and New Orleans: The Tom Jasper.

Telegrams from Liverpool over the Atlantic Cable, are first sent to London, and the Liverpool merchants protest against this practice.

## THE CANAL POLICY OF NEW YORK.

The powerful and sustained canal reform movement now organized throughout the State of New York, has for its object the accomplishment of two definite and important results: To secure the completion of such improvements and repairs as are needed to make the canals what they should be as water ways of sufficient capacity to accommodate all the business that would naturally follow them; and to relieve them of the onerous and unnecessary demands which, without regard to the commercial welfare of the State, are now made upon their income to pay the small remainder of their indebtedness. These results are already in part attained through the passage, by the Legislature, of Senator Hardenburg's bill abolishing the "Contracting Board" and contract system. This, it is true, but partially remedies the evil which the measure was designed to correct, as existing contracts are continued and the Canal Board is authorized to make others if it sees fit to do so; but it is to be hoped that this body, composed of the Canal Commissioners and principal State officers, will have more regard for the commercial interests of the State than to allow the canals to go to ruin under the management of incompetent and irresponsible contractors. The second and equally important object sought by the reform movement still remains to be attained. The plan of funding the canal debt, suggested by Hon. Israel T. Hatch, of Buffalo, relieving the State of the necessity for the immediate payment of the principal, and permitting such a reduction of tolls as would make the canals practically free, is most favorably regarded by the business community. There are some differences of opinion entertained as to the best mode of attaining this result, but the conviction is general that some plan should be immediately adopted by which a material reduction of tolls may be effected. The bill lately introduced in the House of Representatives, by Mr. David L. Bennett, of Buffalo, "to facilitate commerce and diminish the expense of exchanges between the states," has the same object in view, but proposes that the general Government shall do what the reform movement demands that the State shall do itself.

That a material reduction of canal tolls is practicable at the present time is as evident as that it would greatly benefit the commerce, and add largely to the material wealth of the State. Up to the present time many causes have combined to depreciate the credit of our canal system, the principal one being that, while good in its conception, it has been worse than bad in its management. The great difficulty, however, lay not so much in the trunk canals themselves, as in the construction of too many unprofitable "laterals," and needless feeders. A careful investigation of the subject shows that the Erie, the Champlain and the Oswego Canals, have fully paid the cost of their construction and maintenance, and have also developed resources of wealth, and a capacity to bear taxation beyond all anticipation. Auxiliary to these, however, is a system of costly and practically worthless "laterals," the Genesee, Crooked Lake, Chemung, Cayuga, Chenango, Oneida Improvement, Black River, and others. Some of these are useful, it may be, as feeders for the upper levels, and others have contributed more or less each year to the volume of canal traffic; but collectively they have proved a burden to the State, and the cost of their maintenance has been saddled on the trunk lines. It is not impossible, however, to estimate with reasonable accuracy how much the State has gained from her canal system, although it is difficult to separate the Erie from the other trunks, each of which, though of lesser importance, is equally entitled to consideration. In spite of fraud, and of the inevitable waste attending the management of public works, both the Oswego and Champlain Canals have more than refunded to the State Treasury the aggregate cost of construction. The Erie Canal, according to the last report of the State engineer, has cost the State, for original construction, over forty-three millions, for interest on construction account sixty-five millions, and for the cost of maintenance and interest thereon, over thirty-one millions; making its whole cost, as accurately given, \$140,430,953.40. As an offset to this large amount, the Erie Canal has paid in tolls, over eighty-seven millions, and as interest on tolls over ninety-four millions—giving a total income of \$181,828,603.88. Allowing the reduction of a liberal percentage for tolls on freights contributed by the lateral canals, there remains a net profit to the State from the Erie Canal of over twenty-one millions. Few public works can show a better record, or reflect more credit on the sagacity of the far-sighted and practical statesmen to whom their origin is attributable. The original canal was "Clinton's Ditch," and the enlargement "Ruggles' Folly," but every promise of the one has been fulfilled, and every dream of the other realized. Grouping altogether, the three trunks, and the several tributaries with whose insolvency they are saddled, official figures show that the total cost of the canal system of the State, including construction, repairs, interest and "perquisites," has been \$210,068,502.35; whilst the offset to this amount, in tolls and interest, has been \$202,619,515.08, leaving a debit of \$7,473,987.27 to be charged against the State as the amount not yet refunded. From this showing it will be seen that, although our canals have not yet paid for themselves, they are very cheap and valuable property. Of their importance, notwithstanding the rapid growth of the railroad system of the State, as a source of wealth and an element of commercial prosperity, we can best judge from the tonnage statistics of the State Engineer's report, which shows that, during the seven months of navigation, in 1869, the canals moved more freight than carried by all the railroads together during the year.

In the adoption of a wise and liberal canal policy now demanded by the intelligent public, the commercial interests of the State are necessarily a primary consideration. In whatever way the still remaining indebtedness of the canals is disposed of, it is of the utmost importance that a material reduction of tolls should be effected. Although the possession of a magnificent water way from the lakes to the seaboard gives to New York a natural monopoly of the vast and increasing trade of the Northwest, it is

evident that high tolls and the neglect of necessary repairs have resulted into diverting into other and cheaper channels, a considerable share of the traffic that should have followed the canal. Powerful and dangerous rival routes, both of land and water transportation, are springing up on every side, competing for a monopoly of the trade of the interior. The Baltimore & Ohio Railroad and canal, and the railroads and canals of Pennsylvania; the Chesapeake & Ohio road, now bulding, which is designed to tap the vast commerce of the Western rivers at the bend of the Ohio; the project to make Norfolk the outlet of Western commerce; the efforts to turn the volume of trade down the Mississippi to New Orleans on the one hand, and down the St. Lawrence on the other, the many partially successful schemes in New England and Canada to tap this trade on its way to the seaboard, all show how powerful is the competition which New York must resist in order to retain the trade that has mainly contributed to her wealth and prosperity. If to accomplish this, and prevent a still further decrease of canal tonnage, a total abolition of tolls is necessary, the State can well afford to lose the four or five millions annually collected from this source, which is a trifle compared with the profits gained from the handling, selling and transhipment of Western produce.

But aside from the benefits to be derived by both State and city from the vast commerce that would follow the canal if opened as a free channel for the trade of the Ohio and the Northwest; such a reform has an importance in the largest sense national. So heavy are the transportation taxes now levied on this trade that, at the present time, breadstuffs and produce to the value of hundreds of millions is perishing in the West, for the reason that it would cost more to move it to the seaboard than it would bring when it reached there. This fact, and the consequent discouragement of production, is a cause for serious alarm when we consider that it is in Western produce that we must, in a great measure, depend to make up the balance of our foreign trade. Without cheaper transportation, however, we cannot compete with Russia and other grain producing countries in the foreign markets; but with free navigation from the Mississippi, via the Wisconsin and Fox rivers, the lakes and the Erie canal, to the seaboard at this point, the agricultural resources of the country would be more fully and profitably developed, the volume of our export trade largely increased, and the prosperity of our State permanently assured. We commend, therefore, the movement to fund the canal debt and abolish tolls, and hope that before the close of the present Legislative session, the worthy objects sought by the Commercial Union and other State reform leagues may be fully accomplished.—*Commercial and Financial Chronicle.*

## THE FREE PASS SYSTEM.

The following are the comments of the Railroad Commissioner of Ohio, Gen. George B. Wright, on the practice of granting free passes on railroads:

I have so often and fully presented the subject of "dead-head" tickets, that my views must be fully understood by those who have perused my two previous reports; but complaints are so constantly made to me by stockholders and others, that I deem it my duty again to call attention to the subject.

The following classes of persons travel free on all the railroads of Ohio:

1st. All officers, agents and employes of the railroad companies.

2d. The families, for the most part, of all officers, agents and employes of their companies.

3d. Annual passes are exchanged with the principal officers and agents in this State, and with many out of the State, whether having business connection with them or not.

4th. All Government mail officials and agents.

5th. All officers and agents of express or transportation companies doing business over the lines.

6th. Officers and operators of telegraph companies.

7th. Attorneys employed by the railroad companies.

On most of the roads of the State, the following other classes enjoy annual or time free passes, or obtain trip passes from time to time to cover all their personal transportation by rail:

1st. All Judges of courts.

2d. Members of Congress.

3d. State officers.

4th. Members of the Legislature.

5th. County officers—probate judges, auditors, recorders, clerks of courts, and sheriffs, and sometimes their deputies and clerks.

6th. Editors, publishers and correspondents of newspapers.

7th. Keepers of public houses, and oftentimes their clerks.

8th. Steamboat captains and clerks.

9th. Many merchants and shippers.

10th. Justices of the peace and constables, in some cases.

11th. Objects of charity.

These several classes constitute a vast multitude, some of whom may be found on every passenger train in the State, and many of these classes lend their passes to friends, or procure trip passes for them.

The great evils of the system are—

1st. Its effect upon the income of the companies. No reliable data has been obtained upon which an accurate estimate of the loss to railroad companies from this free transportation can be given, but a few companies have kept an account of a portion of their free mileage, sufficient to satisfy them that had one-half the passengers who traveled free the past year paid the regular fare, it would have yielded sufficient to have paid the entire taxes of the companies for the year. When we consider that the State, county and municipal taxes paid in Ohio, for the year ending June 30, 1869, amounted to the sum of \$845,273.61, it becomes a question of great importance to stockholders and

creditors whether a large proportion of this vast sum cannot be saved. If these fares were collected and applied to fencing the railroads, very few years would yield sufficient to inclose every railroad in the State with "a good, substantial wooden fence," as required by law. The proportion of capital stock in railroads, according to miles of road in the State, is \$106,686,116.52. This investment has yielded less per centage to the owners of the stock than has been realized in any other class of business in the State.

2d. The system is demoralizing. It is used to influence traffic on the lines, to silence complaints, to cover up defects, and to secure influence and favor at the expense, sometimes, of right and justice.

3d. It excites jealousy and prejudice, and brings reproach upon railroad management. The system is not exercised with uniformity or regularity, and those least deserving are often the recipients of most favor.

While I entertain the opinion that the right and propriety of exercising this prerogative within reasonable limits rests with the managing power of railroad companies, I cannot regard the system, as now practiced, otherwise than as a great evil, to be modified and corrected only by the action of the managers themselves. No State legislation could probably be had that would effectually cure the evil.

## THE ECONOMY OF STEEL RAILS.

The following calculations exhibit very clearly the great economy of using hammered steel rails on all roads which have so heavy a traffic that four years will fairly represent the average life of the best unhammered iron rails. The cost of re-rolling is estimated at \$30 per ton, and the loss, at each renewal, from wear of iron, expense of taking up and relaying, and other contingencies, at \$15 per ton:

Duration of Steel Rails	30 Years.	40 Years.	60 Years.
Cost of Best Hammered Steel Rails	\$10.00	\$11.00	\$11.00
Compound interest at 6 per cent.	342.79	1,031.48	3,518.64
Total Cost of Steel Rails	352.79	1,131.48	3,669.64
Cost of Iron Rails	76.00	76.00	76.00
Compound Interest	167.73	766.71	2,421.06
Expense of re-rolling	180.00	486.00	690.00
Compound Interest	158.41	1,141.98	4,809.09
Total cost Iron Rails	577.14	2,326.69	7,946.15
Deduct cost Steel Rails	352.79	1,131.43	3,669.64
Saving, per ton, by using Steel	224.35	1,197.26	4,317.51
Present worth of saving	60.00	118.40	130.88
Present saving per mile	6,005.00	11,640.00	13,086.00
Inc. of dividend on a road costing \$40,000 per mile	17.49 p.c.	20.10 p.c.	22.75 p.c.

Therefore, if the average life of a steel rail is only 20 years (—5 iron rails,) it is as cheap to lay steel rails as to lay the best iron rails at a cost of \$6.05 per ton (\$76.00—69.9—\$6.05.)

If the life of steel is 40 years (—10 iron rails,) which is probably a moderate estimate, a saving of \$4,040.00 per mile could be made by laying steel, even if the best iron rails were offered as a gift.

If the life of steel is 60 years (—15 iron rails,) an estimate which is more than justified by the experience of the Pennsylvania, the Philadelphia, Wilmington & Baltimore and other railways, and by a long series of experiments at home and abroad, the saving effected by laying the whole road in steel would be sufficient to add nearly 2 per cent. to the annual dividends, on a road which could pay 6 per cent with a track of the best iron rails.

On roads with a lighter traffic, the saving is still an important consideration. If, for example, the life of an iron rail is 10 years, and a steel rail will only wear out five iron rails, the present worth of the saving by the use of steel is \$17.37 per ton, which makes steel rails at \$110.00 as cheap as the best iron rails would be at \$58.63 per ton.

Even allowing 8 per cent compound interest for the use of money, it would be cheaper to buy steel rails that would wear out in 20 years than to pay \$22.00 for iron rails that would require re-rolling in 4 years.

The great increase of saving on curves or grades in yards and in other places where the wear is so great that the life of the best iron rails is two years or less, is shown in the following table, which is computed at the prices now ruling (\$110.00 per ton for best steel, and \$76.00 for best iron), allowing 6 per cent. compound interest:

Present Worth of Saving on 100 Tons (About One Mile) of Steel Rails.					
	2 Years.	1 Year.	6 Months.	3 Months.	
When Iron Rails Wear 3 Years	\$4,169.41	\$4,886.18	\$5,310.61	\$5,401.48	
If 1 steel — 5 iron rails	10,165.08	12,195.95	15,329.95	13,944.73	
If 1 steel — 10 iron rails	20,328.53	27,307.60	31,637.49	34,322.53	
If 1 steel — 15 iron rails	35,885.80	58,487.41	47,697.91	53,845.19	
If 1 steel — 20 iron rails	59,030.02	46,811.59	61,067.10	70,417.67	

There are some roads of heavy traffic, but only a few, which claim that they can get a year's average service for the best iron rails, where the wear is most severe. The above table shows, that, by substituting a steel rail which would wear only five years, they could effect a saving which would be equivalent to an immediate addition to their capital of \$121.98 on every ton, or \$12,192.99 on every mile of steel laid down. In the extreme case supposed, when the life of an iron rail would be only three months, and the life of a steel rail five years, the saving would be \$70,417.07 per mile.—*Journal of the Franklin Institute.*

—Indianapolis some time since gave \$65,000 of its bonds to the Cincinnati & Indianapolis Junction Railway Company in order to secure the location of its shops in that city. Now the company talks of building the shops at Connersville, and Indianapolis threatens to bring suit for \$100,000.

—It is said that Olive Logan, on a special train from Council Bluffs to Des Moines, made the fastest time ever known on the road. The record is, twenty-seven miles in twenty-three minutes over one stretch.



PUBLISHED EVERY SATURDAY.

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## Editorial Announcements.

**Correspondence.**—We cordially invite the co-operation of the Railroad Public in affording us the material for a thorough and worthy Railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

**Articles.**—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

**Inventions.**—Those who wish to make their inventions known to railroad men can have them fully described in the RAILROAD GAZETTE, if not previously published, FREE OF CHARGE. They are invited to send us drawings or models and specifications. When engravings are necessary the inventor is expected to furnish his own engravings or to pay for them.

**Our Prospectus and Business Notices will be found on the last page.**

## NUMBER ONE.

It is hardly necessary to call the reader's attention to the first article in this number—the illustrated description of the proposed Detroit River Tunnel,—which, we are glad to say, is likely to be built; though it is not yet certain that a bridge will not be erected instead. Our illustrations are engraved from photographs of Mr. Chesbrough's plans, which we have been enabled to copy by the kind permission of himself and Mr. Joy. We are also indebted to Mr. Chesbrough for the facts and figures concerning this, which is likely to be his *chef d'œuvre*. We can hardly hope to present anything so important and interesting very often, simply because there are very few such works in a generation.

The article on railroad accounts we commend to the careful attention of every stockholder. The writer has not only had experience in this department, but he has studied the subject thoroughly, and his opinion has weight. It is one of the most difficult problems in the business of transportation, and in many others conducted by corporations, to institute such a system of checks and balances that the honesty, economy and efficiency of those engaged in the service of the companies may be insured. Not all the corruption is in the financial, management of railroads. And in hundreds of instances where officials and employees are honest, they are not at all economical. Of course there may be different ways of instituting checks and maintaining an oversight of individual operations. If any one has any objection to "Paul Stork's" plan, or any improvements to suggest let him speak. Our readers will be glad to learn that our contributor will present further examinations of the subject.

Telegraphs in these days are essential parts of railroads; and if there are any who do not understand why they are essential, let him read the clear and comprehensive article by Mr. George H. Bliss, the Superintendent of Telegraphs of the Chicago & Northwestern Railway, and an enthusiast in his profession. We need not say to Western telegraphers that Mr. Bliss is an authority on this subject. We introduce him as such to the rest of the world. It and they will be glad to hear more from him.

No one will pass over the letter from Philadelphia, in which the writer, who was formerly a railroad president and is an expert in railroad statistics, and, we may add,

a man of ideas, criticises the management of the Pennsylvania Railroad Company, and presents some very interesting and, we are tempted to say, astonishing statistics of the railroads which carry Pennsylvania anthracite. The criticism of the Pennsylvania does not attempt to show that the company has not been successful, but that in several cases it might have been more successful. It is the old story: we can see what should have been done so much better after the event. All these things should be treasured up. What is not good for an example—and very much of what the Pennsylvania has done is good for that—will serve as a warning. Who is it that objects to the statements of "T. S. F."? Let him come forward, and he shall have a whole page of the RAILROAD GAZETTE in which to state his objections.

We shall not say much of our selections, because the credit of them is chiefly due to other periodicals, the names of which are duly appended. We shall try to give the cream of such articles in American and foreign periodicals as relate to railroads, always making due acknowledgement therefor. So the railroad man will find in our columns what he would be most likely to read in a score or two of periodicals, many of them rare and costly.

We prided ourselves on our railroad news in the *Western Railroad Gazette*. We present it in a somewhat different manner now—better classified and more easily examined, we think. If the reader does not find all the freshest news in this number, it is because we have been compelled to make it up several days earlier than the regular publication day.

Of our editorial columns we are too modest to say much. Others may do that for us—if they can conscientiously. We will say, however, that these columns, necessarily, are devoted in great part to the RAILROAD GAZETTE this week. Hereafter they will be devoted to railroads.

And last, but not least, come the advertisements. They will prove interesting to our readers, as well as valuable to us. Mechanics, machinists, purchasing agents, engineers, and others will find in them a convenient directory. Travelers find there the latest changes in time given with the greatest accuracy, and the advantages of the different routes fully enumerated. We can spare a few more pages for "contributions" of this sort.

So much for number one.

## TIME FOR THE CONTINENT.

When Americans traveled in stage coaches, and sent their most urgent messages by a post-boy on horse; when they existed seventy years and lived only seventeen, it was of little consequence whether they did business by solar, stellar, mean, or Greenwich time. When the stage that was announced to start at six was thought prompt if it fairly started at seven, and when meetings were systematically kept waiting for those whose time was not right; when turnip watches were the rule, and when half the community reckoned their time by a Yankee guess at the sun, this order of things was proper and right and necessary.

Now, however, we are past all this. We no longer reckon our time by a squint at old Sol; it is not even noon when he actually comes to the meridian. He who would travel knows that neither time, tide nor railroad trains wait for him or any other man. Elgin and Waltham watches, set to some standard time, regulate the cars of each line to a minute; and as nowadays the whole civilized world travels by rail and telegraphs by lightning, it is of the utmost consequence that the time kept by one part of the community be kept by all. And it has come to pass that nearly every community has accepted the necessity of being governed by "railroad time," or the time of the particular railroad that traverses it.

But each and every railroad has its own standard of time, generally derived from its leading point, and some long roads have more than one such standard. It is not seldom the case that different railroads centering in the same city have regulators twenty minutes apart. These various kinds of time have to be designated, and confusion is often the result, particularly with strangers and travelers.

In the reform we propose, every railroad stockholder, officer and employee is directly interested, as well as every traveler, and in the latter we include a very large share of the community. Not less, really, though more indirectly, is the interest of every citizen that there should be one standard of time, and one only, for the whole country. British vessels, which scour every sea and gulf on the globe, sail and reckon by one time. Greenwich time is their time everywhere. Our American shipping, what there is left of it, has also its time. Its chronometers swear by Washington all the world over.

Now why should not our railroads be also governed by one standard time—that of Washington, New York or St. Louis? It matters little which, so long as all agree

to be guided by that one, and that only. Trains run now from New York to Chicago in thirty-six hours, but it takes them thirty-eight to return. The journey to San Francisco is made five hours quicker than the home run. Messages from the Atlantic reach the Pacific three or four hours ahead of time itself. Travelers miss connections every day, at great financial or social losses, and even whole trains are wrecked by collisions resulting from a confusion regarding the right of way, simply on account of a want of an universal, or at least a continental, standard of time.

Even science calls for it. The meteorologist who learns by telegraph that a storm is approaching has to modify his data according to the local time when the telegram proceeds. The astronomer's labors are vastly increased and complicated by the necessity for local calculations. The measurement of heights by barometrical means is disturbed by the want of isochronous observations. The solution of meteoric phenomena and many other latter-day branches of science are very largely dependent on the true note of time.

We propose that the local time of some central city, St. Louis, for instance, be taken as the standard for the Nation. If adopted by all railroad lines, the local time would soon conform. New England farmers would then rise at four, dine at eleven, and retire at seven o'clock, while California husbandmen, equally prompt, would not rise till half-past seven, dine at half-past two, and go to bed at half-past ten. The New York banks would open at nine and close at two; those of San Francisco would do business from half-past twelve till half-past five. But no one would necessarily lose railroad trains; no conductors could hold the present confusion of time responsible for their accidents; travelers' lives and railway property would be safer; science in many departments would be promoted; business by telegraph would be facilitated; and the time, disjointed ever since Shakespeare, and long before him, would be no longer out of joint.

Those who might deprecate the change as unsettling the great idea that twelve o'clock is the middle of the day, should not forget that the middle of the day now ranges from 11:45 to 12:15; and the disturbance would in New England be only exaggerated to a few times that amount. Should Washington time be accepted as a standard the principal changes would be of course in the West.

The interests of "railroading" would be very largely promoted by this change, though it will doubtless seem chimerical to many. It is of more importance than the adoption of a decimal measure, and almost incalculably more than the creation of a standard dollar for England, France and the United States. The element of time enters into all our social and business relations, and the need of all keeping time together is far more important than a futile attempt at preserving the stroke of twelve in the middle of daylight.

It remains for our friends of the rail to agitate this question, settle upon a standard and adopt it. Forthwith the traveling public, and presently the whole country will follow in their wake.

## An Extension of the Chicago &amp; Northwestern.

Last Thursday morning a number of influential residents of the western shore of Green Bay had a conference with the representatives of the company in this city with reference to the proposed extension of the Wisconsin Division northward. Railroad men all know, and the rest of the world ought to know, that the company's Wisconsin Division terminates at Fort Howard, the southwestern extremity of Green Bay, while its Peninsula Division begins at Escanaba, at the northern end of the bay. The distance between is about 100 miles. In the season of navigation, the connection between the two divisions is made by steamers, and the journey to Lake Superior is made with some comfort. But in the winter it is hardly made at all. Stages run regularly, to be sure, but the journey is by no means pleasant, and Lake Superior is pretty much cut off from the rest of the world at this season. It has always been the company's intention to extend their road from Fort Howard to Escanaba as soon as practicable. The people on the route and further north are exceedingly anxious to have the road built immediately, and at the meeting referred to the representatives present gave the company assurances that their community would co-operate in every way, as far as they are able, to aid in building the road as soon as possible. If proper steps are taken by the towns on the route, it is intended to build from Fort Howard to Menominee, about half-way to Escanaba, the present year.

The great and growing importance of the Lake Superior trade renders this extension of considerable importance to Chicago, as well as to the country to which it will serve as an outlet.

**A TALK WITH OUR READERS.**

We suppose that some at least of the many thousands who receive this number of the **RAILROAD GAZETTE** will ask, "What is it and what is it for?" that is, they will ask us to give a reason for existing.

We recognize the propriety as well as the probability of such questions. A railroad journal is not a new thing under the sun, but the best of those existing have made themselves interesting only to a comparatively small squadron of the great railroad army; and some, we fear, could give no reason for existing, simply because there is none.

Not many Western railroad men, we think, will be likely to ask that question. Their acquaintance with the *Western Railroad Gazette*, in some cases extending over a period of thirteen years, will cause them to look upon the **RAILROAD GAZETTE**, as its continuation and successor, with some degree of favor, we feel sure. They, however, will be glad to know why we have made so great a change, and what additions and improvements we propose in this new form and under the new name.

We intend to make the **RAILROAD GAZETTE** a complete repertory of railroad news. In its columns will be given accounts of the organization of new companies, the location of new roads, the letting of contracts, the progress of consolidations, the reports of operation, the elections and appointments of officers, reports of traffic and earnings, descriptions of engineering works and improvements in machinery and rolling-stock, and all other matters in which railroad men, manufacturers of railroad supplies, shippers and travelers are interested. This is a department in which success depends chiefly upon the journalist. It can be made full, accurate and interesting by the exercise of enterprise, diligence and care. Enterprise, diligence and care we promise to exercise. In this department we have a reputation to keep rather than one to make. It will be our aim to increase it, and with increased facilities (and expenditures) we have reason to believe that we shall succeed.

But we promise to give something more than railroad news. It is our aim to make the **RAILROAD GAZETTE** a vehicle for the communication of facts and opinions on the different subjects connected with the business of transportation. The questions which are constantly arising among railroad men of all grades cannot be settled without discussion, and can best be settled by a public discussion in which the facts and experiences of a great many men in very diverse situations are given. Transportation by rail is a new art, and its principles are yet to be established. Men are making new experiments, new improvements and new discoveries constantly. To be efficient in his position a railroad man must be learning continually. This is true, to be sure, in some degree, of nearly all professions; but of that occupation which we will call "railroading," it is especially true, because that business is imperfect—in many respects very imperfect—because new applications in new circumstances are made almost every year, and because railroad men are now able to make deductions from the experience of the past forty years.

It will be the especial duty of the **RAILROAD GAZETTE** to record all these improvements in railroading, in whatever department they may be made. We call it "a journal of transportation," and we hope to deserve the name. We shall not be satisfied unless and until it is made an efficient instrument for elucidating the science and perfecting the art of transportation; not by suggestions or instructions of its conductors, so much as by the teachings and discussions of practical railroad men given in its columns. The chief task of the conductors is to obtain information and contributions from such men and to present it in a clear, attractive and worthy manner. We confess that this is not an easy task. Railroad literature, except so far as concerns engineering and mechanics, hardly exists at the present time. Very little has been written concerning organization, operation and management. So the field we have proposed to ourselves is comparatively a new one, and, while it has the freshness and interest of a new field, it has also its difficulties. For much of our work there is no precedent. We must make our own paths in our field of labor.

Without encouragement and assurances of co-operation from those who are qualified by experience and ability in railroad business, we never should have ventured upon our undertaking. But we have received such encouragement from eminent men and from others perhaps not less able though not now so eminent. And we confidently expect aid from many more who have a pride in their calling, and a desire to aid in improving and perfecting it. No man should be willing to let the fruits of his experience perish with him. Much that he has learned by harsh experience can be taught to others who have similar duties to perform.

But we acknowledge that in this department, the discussion of railroad topics by practical railroad men, we must depend upon these men, and our success in this particular will be limited by the extent of their co-operation. How successful our beginning is, the reader of this first number can judge. It is only reasonable to believe that discussion will beget discussion, and that many, seeing, for the first time, a treatise on their special duties, may be led to publish their own opinions on the subject. We invite them to do so. If they disagree with opinions which they find expressed in these columns, the same columns will always be open for a statement of their disagreement and its foundations. We are always glad to publish the opinions of men who thoroughly understand their business.

This statement is made for all departments of railroad business, especially of the operating departments, because those heretofore have had the least discussion. But we do not intend to neglect other departments. Indeed, engineering and mechanics will receive special attention, and with the aid of our able regular contributors we feel more confident of giving these subjects something like adequate attention.

The relation of railroads to the community will occupy a part of our space and our attention. This is a subject which deserves, and shortly will demand the attention of all thinking men. The legislation concerning railroads is often unjust, and at the same time injurious to the public, and the people will never cease to demand and to obtain such unjust legislation so long as the community, or its leading men, remain so generally ignorant of the principles of the business of transportation. The general prejudice against railroad companies will disappear—except where it is justly deserved—when the public understand them better. People generally will not make unreasonable demands deliberately. The attempts which are made in almost every Legislature to pass unreasonable and unjust laws respecting railroads, are almost universally incited by false ideas concerning them, their methods of doing business, and the natural laws of transportation; and, on the other hand, we may say that the impotence of most of these laws has the same origin. Those who make them fail to make them effective, because they have a very inadequate acquaintance with the subject to which their laws apply.

In conclusion, we ask the support of the railroad community. We hope to give matter which will be valuable to all of them, from the presidents down. We are prepared to make liberal expenditures to make this journal an authority on railroad matters. We have begun the work in earnest, and shall not give it up even if the debits exceed the credits on our accounts for a long period. That is, we are prepared to sink money, if necessary, in the attempt to make a complete and authoritative railroad journal, believing that such a journal will be appreciated and eventually well supported by the public.

**Changes in Officers of the Pennsylvania Railroad.**

The resignation of Superintendent Williams, of the Pennsylvania Railroad, has entailed several changes among the most important officers of the operating department. Mr. John A. Wilson, for some time Engineer of Maintenance of Way, and one of the ablest and most accomplished of American engineers, was strongly urged as Mr. William's successor. The choice of the Board, however, fell upon Mr. A. J. Cassatt, the company's Superintendent of Motive Power and Machinery, whose appointment we chronicle elsewhere. Mr. Cassatt is at once a thoroughly scientific and a thoroughly practical mechanic. His opinion on questions involving the manufacture and operation of locomotives and all kinds of railroad machinery is universally respected. Under his charge the rolling-stock of the Pennsylvania Railroad has been improved and perfected until it has won the admiration of all mechanics and railroad men. His position as the superintendent of a department which includes several master mechanics and thousands of workmen has developed in him rare executive ability. He is yet a young man, enterprising, energetic, careful and clear-headed, and there is every reason to believe that he will do credit to the important position to which he has been appointed.

The first general order proclaimed by Mr. Cassatt, dated April 1, 1870, is as follows:

"In accordance with the revised organization for conducting the business of the company, the following appointments have been made, to take effect April 1st, 1870.

"ISAAC DRIPPS, Superintendent of Motive Power and Machinery.

"THEODORE I. HEIZMANN, Engineer of Maintenance of Way.

"JOHN REILLY, Superintendent of Transportation.

"By order of the President."

Mr. Dripps was long the Master Mechanic of the

Pittsburgh, Fort Wayne & Chicago Railway, in charge of the shops at Fort Wayne. That position he resigned some months ago, and since has superintended the construction and furnishing of the new shops of the Columbus, Chicago & Indiana Central at Logansport. He has long been one of the most eminent of master mechanics, and no one will question his qualifications for the position.

Theodore I. Heizmann, the new engineer of Maintenance of Way, has long been in the service of the company, for some time as Resident Engineer at Philadelphia. His place was made for him by the resignation of Mr. John A. Wilson.

John Reilly, Superintendent of Transportation, has we believe, rather a change of title than a change in duties. Under Mr. Williams he has been Assistant General Superintendent. The duties of that office are, we believe, included in those of Superintendent of Transportation in the "revised organization."

In this connection we give the resolutions respecting Mr. Williams which were adopted unanimously at a meeting of the Board of Directors of the Pennsylvania Railroad Company on the 23d ult., on motion of Mr. Kennedy:

WHEREAS the resignation of Edward H. Williams, Esq., General Superintendent of the Pennsylvania Railroad, to take effect April 1, next, has been received and adopted, and

WHEREAS it is eminently proper that the Board of Directors should recognize the valuable services rendered by him during his term of office, therefore

Resolved, That the Board of Directors of the Pennsylvania Railroad Company, in receiving the resignation of Mr. Williams, General Superintendent, desire to place upon their records their appreciation of the valuable and faithful services rendered by him to this company while holding that position.

Resolved, That the best wishes of the Board accompany Mr. Williams in his new sphere of action.

Resolved, That the Secretary be instructed to furnish Mr. Williams with a certified copy of these resolutions.

**Condition of the Pacific Railroads.**

We last week published a letter from Mr. A. N. Towne, General Superintendent of the Central Pacific, in which he said that no train had been detained an hour on that road this winter on account of snow. This week, Mr. H. E. Sawyer, General Agent of the Great Central Route for the Pacific coast, arrived in this city, and he fully confirms Mr. Towne's statement. Mr. Sawyer has passed over the Union and the Central Pacific roads twelve times since last summer, and he asserts, without hesitation, that no two roads in the United States are in better condition and that he hardly knows where to find two as good. He has never missed a connection, and never been behind time in all these journeys, whose aggregate length is more than twenty thousand miles.

We understand that westward travel over these roads has increased materially of late, and the prospect for summer business is excellent.

**Not Wanted.**

Let us say in advance that we respectfully decline contributions intended to recommend the bonds of any particular railroad line, to puff or to injure any particular railroad man, or to bolster up any particular railroad corporation. News concerning the organization, location and progress of new roads we want, but not long disquisitions concerning the wonderful traffic which will burden a certain line, if it but succeed in getting itself built. In general, we may say, we do not want puffs but news interesting to railroad men.

**THE TRAVELER'S LIFE AND ACCIDENT INSURANCE COMPANY.**—We published three weeks ago in the *Western Railroad Gazette*, and again last week, an article from the *Evening Post* of this city concerning the Traveler's Life and Accident Insurance Company of Hartford, whose agent in this city is Mr. J. Culver, who has his office over No. 66 Clark street. But in the copying one very serious omission was made. A paragraph stated that "one in fourteen of all its 176,000 policy-holders have been paid for claims under accident policies in amounts varying from \$10 to \$10,000 each." In the *Gazette* it read "one in fourteen of all its 176 policy-holders," instead of 176,000. We take occasion to say that this company is not doing business on so small a scale. It is acknowledged a thoroughly sound company, and it counts its policy-holders by the hundred in this city alone.

It is not often that so great a mistake is made on account of naught. Naught was left out, and yet there was an omission of more than 175,000. You see, if 000 is without other figures, it is naught; with others it is not—that is, not naught. Not knotty, is it?

James Charlton, who was many years, and until quite lately, General Agent of the Great Western Railway of Canada, has been appointed General Ticket Agent of the North Missouri Railroad, in place of A. W. Millsbaugh, who retires. Certainly the North Missouri is remarkably fortunate, for Mr. Charlton is unexcelled in his knowledge of and skill in his business, and at the same time is a most accomplished gentleman. We are very glad to have him this side of the line.

## Contributions.

### PHILADELPHIA CORRESPONDENCE.

*A Criticism of the Management of the Pennsylvania Railroad—The Great Anthracite Carrying Lines.*

PHILADELPHIA, March, 1870.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The downward fluctuation in gold, followed by a marking down of prices, is fast approximating the country to a specie basis, the enduring corner-stone of the commercial fabric.

In the stock market railroad shares are already down to a hard-money standard, not a few of them below it; for, when commerce suffers a depression, merchants are the first to abandon stock ventures, having enough to do to take care of their own legitimate business; and capitalists, knowing this, and appreciating the downward tendency of prices, rather accelerate the decline, holding themselves ready, meanwhile, to reinvest when it shall appear that bottom has been reached, and that thereafter a rise is inevitable.

There are trade winds and tides in cities as well as in seas, and ventures are voyages resulting sometimes in disaster, sometimes in narrow escapes, and now and then in fortune; the percentage of success being always small. And this is true alike of the professions, the industries, and indeed of all human avocations. Communities of men are like forests of trees; there is one common stature, with here and there an overtopping specimen. Field trees have deep roots and wide-spreading branches, because they have more room and air and sunshine than the forest affords; and so men in conspicuous office have greater opportunities to mature gifts and develop greatness than their fellows in the multitude. Especially are railroad presidents favored with opportunities to achieve lasting distinction, since *personal government* has hitherto been the rule in the great railroad corporations of the United States. And yet, notwithstanding that railroad presidents wield imperial power in the council board, and absorb a monopoly of newspaper puffing, still we find in the record of their official acts, as written by themselves in their annual reports, errors enough to demonstrate the common fallibility of human nature; also that since the ascension of Him who spake "as never man spake," there has been no Godlike mortal on the earth.

Take, for example, the Pennsylvania Railroad Company, which in its recent annual report made official confession of the failure of its policy for interchange of traffic with western connecting lines.

The Philadelphia public knew that the Pennsylvania Railroad Company dominated and controlled important connecting railroads in Pennsylvania, as for instance the Cumberland Valley, the Northern Central, and the Philadelphia & Erie Railroad—and the Philadelphia public believed that the Pennsylvania Railroad Company occupied such relations with Western railroad connections, at and beyond Pittsburgh, that no possible *coup d'état* could deprive her of them. But in this view they were undecided by unexpected events in 1869, of which President J. Edgar Thomson, in his latest report—the same being his eighteenth and the company's twenty-third annual report—says:

"An effort was inaugurated by the Erie Railway Board to absorb not only the Pittsburgh, Fort Wayne & Chicago line, but nearly all the Western connections of the Pennsylvania Railroad Company, which only failed from a misapprehension of the terms of the law under which they proposed to accomplish their object, and subsequent adverse legislation procured by the President of the Fort Wayne Company."

To head off this Erie movement, the Pennsylvania Railroad Company leased the Columbus, Chicago & Indiana Central Railway Company's lines, paying therefor thirty per cent. of the gross earnings; also the Pittsburgh, Fort Wayne & Chicago Railway, paying therefor interest on debt and twelve per cent. on shares, clear of taxes. Subsequently the Little Miami Railroad was leased at eight per cent. on a stock basis, which was made specific by a seventeen per cent. share dividend. These leases, which cover and include 1,496½ miles of road, are all high; and however important to the Pennsylvania Railroad Company, they serve at the same time to demonstrate how much cheaper and more profitable it would have been, had the Pennsylvania Railroad Company, instead of selling out its investment in the Pittsburgh, Fort Wayne & Chicago Company, made itself owner of a majority interest therein. The Pennsylvania Railroad Company had control of the organization of the Pittsburgh, Fort Wayne & Chicago Company at the time when the latter was prostrate in credit, and whilst many of its shares, at low prices, were floating in the market.

At date of December 31, 1862—see first annual report

of the Pittsburgh, Fort Wayne & Chicago Railway Company (then recently organized out of the old company)—the stock and debt stood in these amounts, to wit:

Capital stock.....	\$5,769,591.61
Bonded debt.....	12,985,178.00
Total.....	\$18,644,764.61

The lease of the Pittsburgh, Fort Wayne & Chicago Railway Company is twelve per cent. on a described share capital of \$11,500,000, but which total has been enlarged, on a seven per cent. basis, to \$19,714,226—since increased to \$19,563,000.

Total..... \$82,277,286

The bonded debt bears seven per cent. interest, the same as the shares on the enlarged basis. The shares alone, it will be observed, amount to more than the entire liabilities of the company at the date of the reorganization!

According to a circular letter dated Pennsylvania Railroad Company's Office, March 1, 1870, the company held "investments made in connecting lines," including the Harrisburg & Lancaster Railway, amounting to \$20,055,741.93.

At date December 31, 1869, the investment in the "Pan-Handle line," between Pittsburgh and Columbus, amounted to \$7,676,695.31

J. Edgar Thomson, Esq., was elected President of the Pennsylvania Railroad Company on the 2nd of February, 1852. The company then had a share capital of nine millions of dollars, and no debt. The first mortgage loan for three millions of dollars, at six per cent. interest, was sold above par. Hence the company had credit when he assumed the Presidency, and its credit to this day has been uniformly stronger than that of any other railroad corporation in the United States.

The subscriptions made in aid of Western connections of the Pennsylvania Railroad, by the city of Philadelphia and the Pennsylvania Railroad Company, were all made subsequent to the election of President Thomson.

On the part of the city they comprised \$750,000 for shares in the Northwestern Railroad, to put the Pennsylvania Railroad in connection with the Cleveland & Mahoning Railroad, and by that route with Cleveland. The last named road is leased by the Atlantic & Great Western Railway Company, and is operated by the *Erie*—a result very different from the original intent.

The Hempfield Railroad Company received from the city of Philadelphia \$600,000 in aid of a railroad from the Pennsylvania Railroad at Greensburg to Wheeling. The road is in operation from Washington Borough west to Wheeling, but is controlled by the Baltimore & Ohio Railroad Company—another result not in the original programme.

The Pennsylvania Railroad Company subscribed \$750,000 of capital shares in the Marietta & Cincinnati Railroad, which is operated in the interest of the Baltimore & Ohio Railroad Company as a link in its short line to Cincinnati.

The Pennsylvania Railroad Company made subscriptions in aid of the three several links which comprise the existing Pittsburgh, Fort Wayne & Chicago Railway Company. The Chicago end was built by that company.

The Pennsylvania Railroad Company, however, years ago, acquired and now own a majority interest in the Pan-Handle Route from Pittsburgh to Newark, and a half interest thence to Columbus.

From this rapid retrospect it will appear that the *diplomacy* which purchased the control of the Cumberland Valley, Northern Central, and Philadelphia & Erie railroads contrasts favorably with the high-price leases of the Columbus, Chicago & Indiana Central, the Pittsburgh, Fort Wayne & Chicago, and the Little Miami!

At date December 31, 1869, the expended capital of the Pennsylvania Railroad Company was:

Capital stock.....	\$33,493,119.50
Bonded debt.....	23,964,911.46
Total.....	\$57,458,028.96

Earnings for 1869:

Pennsylvania Railroad main line and branches.....	\$17,260,811.73
Philadelphia & Erie Railroad.....	3,362,705.29

Total earnings of both roads..... \$20,513,517.02

Expenses:

Pennsylvania Railroad.....	\$12,903,967.60
Philadelphia & Erie Railroad.....	8,394,218.25

Total expenses..... \$15,297,485.85

Net earnings..... \$4,966,031.17  
Those roads are operated with 608 locomotive engines: average earnings for each locomotive, for year 1869..... \$95,984.07

Lehigh Valley Railroad, November 30, 1869:

Capital Stock.....	\$17,716,400.00
Funded and Floating Debt.....	5,655,564.00

Total capital and debt..... \$23,371,964.00

Gross receipts for 1869.....	\$1,926,061.06
Operating expenses.....	2,891,060.37

Net receipts..... \$2,104,610.69  
Locomotive engines 156, average earnings per engine..... \$36,213.68

Philadelphia & Reading Railroad, November 30, 1869:

Capital Stock.....	\$29,023,100.28
Bonded debt—no floating debt.....	7,819,592.18

Total capital and debt..... \$36,842,692.41

Gross receipts for 1869.....	\$11,208,381.18
Operating expenses.....	6,876,319.67

Net receipts..... \$4,332,068.51

Locomotive engines, 297. Average earnings per engine..... \$37,738.65

The railroad expert will do well to ponder the foregoing.

Every railroad man in America has heard of the great carrier of anthracite coal in Pennsylvania—the Philadelphia & Reading Railroad; but very few appreciate it at its worth, for the simple reason that, whilst a majority of its shares are held for investment and to assure its control, there is a large minority of its shares afloat in the market, it being the only company in the United States whose shares are operated in to a large extent in both cities, Philadelphia and New York.

Twenty thousand Reading shares are sometimes sold in a single day in the Philadelphia Board of Brokers, and by means of the telegraph the shares are kept seesawing between the two cities.

A number of years ago the Reading Company had, also, a transfer office in Boston, but it is now closed. Subsequently an effort was made to close the Reading transfer office in New York, but the leading Brokers, roused by a threatened curtailment of "bread and butter," or in other words, a diminution of commissions, raised such a row over the proposition that it was indefinitely deferred, and so Reading shares continue the sport of *Bulls and Bears*.

And most true it is, that stocks which are exposed to quotations in two markets undergo greater fluctuations than if transfers are restricted to a single office. Thus Philadelphia & Reading shares sell for less price than Pennsylvania or Lehigh Valley Railroad shares, albeit the percentage of net earnings on capital invested is largely in favor of the Reading company, as official exhibits attest.

The financial status of the Philadelphia & Reading Railroad Company will, however, more fully appear from the subjoined comparison, instituted between the Philadelphia & Reading Railroad Company on one side, and the Lehigh Valley Railroad, the Lehigh Navigation Company and the Central Railroad Company of New Jersey on the other side. The two Lehigh companies (one of which also owns a canal) each own a first class railroad from Easton into the Wyoming coal field, with branches penetrating into other coal basins. At Easton, at the mouth of the Lehigh river, these two competing roads both connect with the Central Railroad of New Jersey, which delivers their traffic on the waters of New York. The Lehigh Navigation Company's Railroad is known as the Lehigh & Susquehanna Railroad. The figures given in each case are of the latest date made public:

	Capital & Debt.	Gross Rec'ts.	Net Rec'ts.
Lehigh Valley R. R. Co. ....	\$93,271,944.96	\$4,925,061.66	\$4,104,010.69
Lehigh Navigation Co. ....	23,810,178.29	1,796,679.99	747,595.73
Cent. R. R. Co. of N. J. ....	18,034,675.90	8,739,412.66	1,350,319.86

Total..... \$64,916,818.37

Phil's & Reading R.R.C. .... \$6,842,692.41

..... \$11,208,381.18

Difference..... \$28,074,125.96

..... \$4,332,068.51

..... \$130,312.23

It will be perceived that, whilst the investment of the Reading is low, its gross and net earnings are more than the three companies combined.

The exhibits of the Reading and Lehigh Valley companies are for the year ending November 30, 1869; the exhibits of the Lehigh Navigation and New Jersey Central companies are for the year ending December 31, 1868, the reports for 1869 having not yet appeared.

Fortunately for the share holders in the anthracite carriers, the railroad companies operate their own lines with their own cars; and so, whatever profit accrues from the transportation of anthracite is enjoyed by the proper parties. To be sure, it would require no little assurance to assign the business of carrying coal from breakers at which cars are loaded by gravity to shipping docks where said cars are unloaded by gravity, to independent stock companies known as "freight lines." And in keeping their own business out of the custody of "freight lines" the carriers of anthracite have a great advantage over the carriers of petroleum in this State. Oil cars are filled by the gravity process with crude oil from tanks in the well region, and are emptied by the gravity process at destination. Nevertheless, this business is assigned, in this State, to independent "freight lines."

The consequence of this practice is shown in the figures which follow:

Quantity of petroleum of all kinds exported from Philadelphia and New York, for the year 1868 and 1869:

	1869.	1868.	Inc. & Dec.
From Phil's' gallons.....	\$1,445,853	46,505,080	7,050,008
" N. Y. " .....	65,953,690	51,803,919	12,180,486

This result was brought about by the "Erie" cutting under rates ordinarily charged on oil; but, on the other

hand, had *Erie* been offset in her oil rates, as she was in her merchandise rates when freights were carried at less than cost from Western cities and Atlantic seaports, the oil trade would not have been diverted. Again: had the Philadelphia lines, at the first development of the trade, imposed the same rates from the oil region *via* Pittsburgh to Philadelphia, as were imposed from the oil region *via Corry* to New York, the owners of the hundred and fifty miles of road between Cleveland and the oil region would have had to carry crude oil from the wells to Cleveland and refined oil from Cleveland to Corry, *without charge*. Then the refineries would have been concentrated at Pittsburgh and along the Allegheny Valley, and the Philadelphia lines would have concentrated the export oil trade in this city, the New York lines being unable to prolong competition.

Bear in mind, ye men of the West, that Pennsylvania furnishes a prodigious tonnage from her coal mines, ore beds, iron furnaces and oil wells, for transportation by railroad to market.

The magnitude of this *domestic* movement will be appreciated when it is understood that, for the year 1869, the number of tons of freight moved on three railroads in Pennsylvania, to wit; the Pennsylvania Railroad, the Lehigh Valley Railroad, and the Philadelphia & Reading Railroad, exceed the number of tons moved in that year on all the railroads in the State of New York!

Also, that, whereas for the year 1869, there were moved on the railroads of Massachusetts of freight, 7,091,448 tons; there were, in that year, moved on the Philadelphia & Reading Railroad, of coal and merchandise, 5,662,195 tons. Length of main road in Massachusetts, 1,407 miles; length of Philadelphia & Reading Railroad, main road, 98 miles!

The cosmopolitan characteristics of London, Paris and New York fill the world's eye; nevertheless, there are in each of the nationalities of which the cities named are the commercial, monetary and postal centres, other great centres of opulence, population, natural resources, manufacturing industry and mechanic art.

T. S. F.

#### THE TELEGRAPH AND ITS MODERN APPLICATIONS.

BY GEORGE H. BLISS.

The utility of the telegraph in connection with railway service is rapidly becoming better appreciated. Like the printing press and the use of steam it has sprung into a position of commanding importance in spite of prejudice and every obstacle. When Professor Morse appealed to the Nation for assistance in the construction of an experimental line, and to the public for support, he was met with ridicule and prediction of failure from many learned heads, whose prophetic foresight has since been proven thoroughly visionary. When a Superintendent on the Erie Railway first attempted to suspend a time-card rule and run a train by telegraph, the conductor absolutely refused to obey, mistrusting the sanity of his superior and the correctness of the dispatch. This lack of confidence has given way to an implicit reliance, extending into the most detailed management. The telegraph has become the nerve, bringing intelligence to the brain power that moves the road, warning of danger, retrieving disaster, and causing all things to move forward with harmony and purpose. It has rendered possible the manipulation of the large railway corporations of the country, bringing within the iron grasp of a single mind the utmost minutiae from points a thousand miles distant with more certainty and exactness than under the old system could be done on a single hundred miles of road. By it, engines and cars are made available to their fullest extent. Take a case where some train having a right to the track is delayed, and its detention holds others in check. The Train Dispatcher is master of the situation, and, having full knowledge of the circumstances, will move each train from station to station, arranging new places of meeting so that the least possible time is lost, and with as much freedom as a chess-player can pass his piece from square to square on his board. Notwithstanding this manifest benefit, there are prominent roads which only within a few months have made any attempt to secure the advantages within their reach, in this direction. In busy seasons, when cars are worth from fifty to one hundred and fifty dollars per day, immense trains of empty freight cars leave Chicago daily, the destination of not a single car being known; but while in transit, by means of the telegraph these are distributed to the points where the demand is most pressing. A just estimate of the saving effected in this manner would astonish many who have never given the subject the thought it deserves.

If a bridge is carried away, before it fairly leaves the abutment, your Civil Engineer is telegraphing his specifications to half-a-dozen shops, and by the time the loss would be known formerly, trains are hastening with

completed material for the new structure. The management of the passenger and freight business in all matters requiring speed, and, in fact, the concentration of effort at the right time and place in all departments, depend equally on the telegraph. In such high esteem is the telegraph held by some railway officials that they prefer a single-track road with the telegraph to a double-track without, and when the relative cost is considered, the tribute is a high one.

Such being some of the benefits of an efficient telegraph system, how important it is that every railway company should possess the best that a reasonable outlay will obtain. The attempts in this direction have, many of them, fallen far short of the desired end. Some have failed from an error of organization, some from puerile economy, and some from gross ignorance. Electricity is the most subtle of agencies, governed by laws which must be closely studied, and tested by experience in order to be mastered. It is not strange, when lines are placed under control of persons having only a surface knowledge or in the hands of those whose other duties usurp the larger portion of their attention, that they fail to give satisfactory service. It cannot be expected that wires will work well when constructed in violation of the principle that the means must be adapted to the desired end. When companies invest fifty thousand dollars in a fancy engine and thirty thousand in a directors' car, and deny the few thousand necessary to equip their roads with first class telegraph facilities, their wisdom may justly be considered questionable.

I appeal to the fraternity if it is not absurd that a severe rain should render our land wires useless for distances over one hundred miles, and in many cases much less, when wires can be stretched from shore to shore beneath an ocean of moisture and worked with a battery no larger than a lady's thimble. True, the obstacles of the land lines are somewhat different, but there is nothing in their way which cannot be overcome by a judicious expenditure of money. Is it not a cause for regret, that, while an American originated the first practical system of telegraphing, which is now in use on nine-tenths of the existing lines, that in scientific attainment, investigation, and adaptation we are far surpassed by the English and other Europeans. They have long used apparatus by the means of which, so to speak, electricity can be weighed, measured, and gauged, determining the relative merit and capacity of wires, instruments and batteries, resulting in a perfection unknown among us. For the lack of this attainable knowledge, the telegraph authorities in this country have made many ludicrous and expensive blunders. A plain glass insulator was early in use, but was deemed objectionable on account of breakage. To remedy this the Wade insulator, which was constructed by covering a modified form of glass with a tar-saturated wooden cap, was introduced at more than double the cost. Many hundred miles of lines were thus insulated, when the discovery was made that the wooden caps acted as a sponge to retain moisture, the great enemy of insulation, while any concussion broke the glass, destroying all insulating power, but still leaving the insulator externally in perfect condition. The glass in many of these insulators was broken by the heat of the tar, in the process of manufacture, and they were worthless from the start. The result has been that during the last two years thousands of these insulators have been displaced, and plain glass insulators substituted, at no inconsiderable expense. A few practical and scientific tests might have demonstrated the faults of this insulator before it had ever been put into actual use. It is the European custom to test every insulator thoroughly before putting it up, and this inspection leads to the rejection of a large percentage; while we, with culpable negligence, put them into lines, indifferent as to their real condition, if externally sound.

During the past few years the telegraph community has been running wild on the subject of resistance. Relays have been manufactured having a resistance as high as one hundred and fifty miles, taking as a standard No. 9 iron wire perfectly insulated, and many more approximating this figure have been made. These enormous resistances, placed in lines without reference to the size or length of the conductor, have rendered excessive battery power necessary and caused the current to escape wherever the insulation showed the slightest defect. It is now conceded that thirty miles is a maximum resistance for a relay, and that on many wires a much lighter resistance is sufficient.

Little attention has been paid to the size and quality of conductors. To force a current of electricity over a small wire is like trying to compel a large stream of water to pass through an inadequate pipe. What an eighty-pound rail is to a sixty-pound, a No. 7 is to a No. 9 conductor. A No. 9 galvanized wire is in common use here, though a few companies, like the Chicago, Burlington & Quincy, are using a No. 7. This does not equal many of the foreign lines, where No. 4 is used for

long wires, after being subjected to the severest tests. One of the most simple tests is to make an ordinary connection, then disconnect, and again connect, twisting it in the opposite direction to the first splice. Probably not one tenth of our wire would stand such a trial. The three great requisites of a good telegraph line are strength, conductivity, and insulation. No material ought to be used but the best, and great care should be taken in proportioning it.

The idea has been suggested that something could be gained by substituting a twenty-foot pole with cross-arms for the twenty-five-foot pole with bracket insulators. By spreading the wire on cross-arms they could be raised to the same average height, and the leverage upon the pole by winds and sleet greatly diminished, while there would be less liability to crosses than with the wires near the pole and directly under each other. The upper surface of every cross-arm should be beveled.

The character of a conductor depends largely upon its size and quality, so that the questions of strength and conductivity are closely linked together. Any improvement in one favorably influences the other. The most perfect insulator is always the one to buy, no matter what it costs. A line may be strong as adamant and a thoroughly good conductor, but if the insulation is defective it will not be serviceable. Happily, in the recent discovery of paraffine—the best known insulating substance—the combination of copper and steel for a conductor, the introduction of delicate testing apparatus, and the awakened interest in telegraph circles upon the more advanced problems of the profession, a new dawn is breaking upon telegraphy in this country. The invention of the system of double transmission, by which messages can be sent in both directions at the same time on the same wire, will largely increase the capacity of lines and is significant of the era of cheaper telegraphing.

If the American people ever commit themselves to the folly of presuming that a government monopoly, under the name of a Postal Telegraph, can transact the business to better advantage than competing private enterprises, no success will be obtained without the co-operation of railroads. A free and independent telegraph line is a necessity to every road, which can maintain it cheaper and better than any other party. By contracts with railways, based upon the mail service plan, the local business could be done and through wires provided for by rental, so that the Government would be obliged to invest only the comparatively insignificant amount needed for city wires. It is nonsense to say that the government could not command the best telegraph talent of the country, and a slur upon our institutions to believe that such a department could not be managed with a degree of honesty commensurate with that of the community at large.

The application of electricity to dial instruments suitable for the use of business firms on short lines, to hotel annunciators, to fire and burglar alarms for dwellings and cities, to illuminating and medical purposes, and to electric brakes, all testify to the merits of this agency, which pervades every animate and inanimate thing.

I cannot close without calling attention to the telegraph lines recently constructed in Chicago, which are the pride of every telegrapher, and ought to be of every citizen. The size of the poles, the use of Brooks' paraffine insulator, the character of the work and general plan, are worthy of the highest commendation. It may be questioned whether anything has been gained in strength and symmetry by putting the largest arm at the top, and thus reversing Nature's method of growing a tree; but until our wires shall be introduced into the city under ground, these lines will stand and hold a first rank among the city lines of the nation.

#### THE DEPARTMENT OF RAILROAD ACCOUNTS.

*Its Uses and Abuses, and the Relations it Bears to the Other Departments of a Railroad.*

BY PAUL STORK.

Before entering into an explanation of the minutiae of railway accounts, or attempting to discuss the merits of the many different systems in force, the chief excellence of which, I am sorry to say, too often consists in their ability how not to do that which they are ostensibly so earnestly striving to accomplish, it is necessary to a proper appreciation of the subject that we should first understand the pernicious connection which exists between the department of accounts and the managing or operating department. I say pernicious, because the two departments ought to be and are, naturally, antagonistic, and should, therefore, be independent of each other in their management.

The operating department is positive in all it does, while the other, in its normal state, is, at best, merely passive; and the antagonism between the two arises from the fact that the archives of the latter contain all the

data from which an intelligent and trustworthy estimate may be formed of the wisdom and fidelity that has been observed in the active operations of the road. If this evidence can be entirely suppressed, or never produced, except in a shape calculated to make a favorable showing for the management, then, of course, there is no apparent antagonism; but the moment that all this accumulated evidence passes into the hands of an independent and comparatively disinterested person, who cares only for the abstract question of right, and whose only object is to arrive at the facts, that instant the natural antagonism between the two departments becomes open and apparent. It is to be expected, then, that a sagacious manager would seek in all possible ways to control or secure possession through pliant subordinates of this mine, so rich in its evidences for and against him. Such being the case, it is natural to suppose that the President and the Board of Control, equally wise and far-seeing, and knowing how entirely their property is in the hands of the manager, would jealously sustain and build up this department, the independence and disinterestedness of which is so necessary as a check. Yet the reverse is the case. The arrangement upon some of our roads would seem to indicate that a feeble effort had been put forth at some time or other to make the department independent; but the effort, if there ever was one, evidently did not contemplate any active support of the department, or the granting to it of sufficient power to enable it to sustain itself, but left it at the mercy of its covert enemies, the active managers of the property.

A railway may be compared to an enormous ostrich, the heart being the stockholders. But with this difference, that in a railway, unless great care is exercised, much of the blood flowing from the heart, instead of returning to gladden and nourish the original fountain, disappears into myriads of thirsty and insatiable little channels and crevices, and is thus absorbed and forever lost sight of. Continuing the comparison, the body and sinews may be termed the roadway and property; the brain being the President and Board of Directors; the tail acting in the capacity of an extra rudder, or storm pilot, resembling the chief law officer; the stubby wings, important but not indispensable, answering to the general freight and ticket departments; the treasury, automatic in its action, being the mouth; the managing or ponderous physical department, with its immense power and influence, being the legs; and, finally, the department of which it is proposed to treat, and in which the writer at one time had some experience, may be termed the secretive, digestive organ, the stomach. It is not visionary, has no magnificent projects, indulges in no ambitious dreams. On the contrary, it is sober and contemplative, as they are apt to be who deal only with facts.

The accounts, then, bear the same relation to the physical part of a railroad that the stomach does to the legs of an ostrich, with this difference: that in the former case there is a natural antagonism between the two. But so long as the stomach, in the performance of its unseen functions, works subordinately to the merely muscular part, this antagonism is not remarked, and the ponderous legs of the gigantic bird respond cheerily in retreat as well as in attack; but let the stomach refuse to act in this subordinate and restricted capacity, and if the legs are weak and unreliable, as they sometimes are, notwithstanding their immensity, it is both amusing and painful to see with what ludicrous clumsiness they knock together. The stubby little wings, alarmed for their support, flap excitedly; the tail rises and falls sympathetically; the jaws close with a click; the mouth appears impregnable. Amidst all this alarm the blood resumes its natural course, flowing steadily and tranquilly towards the heart; the brain, however, is bewildered, and is unable to distinguish the sham from the real; and the result is that the stomach, receiving no encouragement from any source, becomes demoralized, and makes haste to secrete what it cannot digest. But such is the sublime assurance of legs, that, even when reduced to the desperate plight mentioned, they only strive the more fiercely to display and encourage confidence in their seemingly magnificent proportions. "It's all owing to that infernal stomach of mine," ejaculates legs sympathetically, "and reminds me that my own comfort, and the comfort and security of you, my trusty friends, demands that its independence should be crushed out. And although none of us have ever given a moment's study to the science of digestion, still we shall have no difficulty in making it apparent to the brain that so much complication is unnecessary, that all that is needed, in fact, is a simple and perfectly straight channel, or several channels would be better, all running without check or hindrance. We will at once and forever damn the whole system of checks by calling them "red tapeism." That will at once awaken the head to the necessity of summarily reconstructing this

contumacious organ; for although the head makes no use of it, and does not seek or desire to know anything unless it comes officially from these magnificent legs, and is in general an ardent believer in their infallibility, still he has not heretofore actually seconded my wishes in this matter, so important to our whole system, but has weakly hesitated; and if it was not apparent to the dullest comprehension that everything should act subordinately to the muscular part, I should think that he foolishly imagined that perhaps the stomach knew best what was necessary in the performance of its duties. We will not forget to broach the simplicity and economy of the straight channel system to him. It don't require any effort to understand that. Under the present complicated system each particle that constitutes life is carefully scrutinized and minutely traced; yet the insignificance of the organ, coupled with its knowledge of the fascination exercised by these legs and their power to crush, makes it very timid—so timid in fact that it passes for a mere automaton amongst all legs, both great and small. But as it does sometimes pluck up a little courage, we will first bring it into general disrepute, then reorganize it and oust its chief manipulator, who has on several occasions hesitatingly attempted to make the head listen to his maudlin stories and uninteresting facts; though it is gratifying to know that he only got mildly snubbed, for the head very cordially despises him and is, I am happy to say, perfectly oblivious of the fact that through this despised organ he might, by sustaining it, get information both definite and trustworthy, besides making these legs do much better service than at present with less nourishment. So you can readily understand, gentlemen, that we should never lose an opportunity to humiliate and belittle this our natural enemy. And although he is now perfectly harmless after the severe drubbing we have just given him, still, for fear that he may in some unguarded moment again manifest his old and apparently inherent weakness for facts, we must lose no time in getting the organ under the charge of some docile creature—one of the bread-and-butter sort, you know—or else break up the whole system, substituting other channels under the supervision of our own good and trusty satellites."

And the anatomically disposed student will discover, upon dissecting many of these gigantic birds, that instead of one grand channel through which everything passes, and which is presided over and controlled by a sturdy and independent member whose duty it is to see that the particles which support life are really, as well as seemingly, distributed to the body and sinews, that there are, instead, several channels, all organized and acting upon the principle that though the body may decay and nothing but the skeleton remain, still the legs must be loudly upheld. And so nicely arranged and manipulated are these channels, indeed, that should some suspicious or dyspeptic member of the head inadvertently venture to express an opinion as to the actual strength or capacity of the legs, one or all of these little channels are at once busy producing statements to prove that the body, owing to the strength and cunning of the legs, is really very healthy and vigorous; that there never before existed so faultless a pair of legs; that there never was a pair of legs that could carry a heavier load, a given distance, in less time and at so small an expense. And the dyspeptic member, with feelings of shame and regret, steals silently into the background, while the little channels, each with its little head, trundle and leap right merrily as they discuss the discomfiture of their enemy. And indeed the ingenuity they have displayed in covering up and explaining their patron's faults entitles them to his lasting gratitude, which he repays by infusing a little more nourishment into the thirsty channels; or, if there is but one channel, as is sometimes the case, with a docile creature to direct it, then legs uses him in his own inimitable and genial way, and afterwards pats him familiarly on the back and good-naturedly expresses his admiration of the sagacity and industry he displays in the conduct of his department; and the docile little creature, trembling with ecstasy, struts proudly back to his den, to await patiently another opportunity to bask in the sunshine of those royal legs.

The picture is not exaggerated, on the contrary, disgraceful as it seems, it falls far short of the reality.

That the department of accounts is allowed to occupy, in the internal management of our roads, the subordinate and despised position that it does—a position so restricted that it can with difficulty make itself respected by the lowest subordinates; with so little power that it cannot make itself heard, even by the President, without incurring the bitter hostility of those who are constantly seeking to control it and use it to cover up any evidences of mismanagement—that it is allowed to occupy this position is inexplicable to every intelligent person. That its effect is pernicious and demoralizing in the extreme to all but the most honest and capable of our railway officers, no one conversant with the facts would attempt to deny, and upon no ground can it be

explained but upon the hypothesis that those who control our railroads have not sufficient practical knowledge of the details of railway management to appreciate the incalculable benefit that may be derived by means of checks between different departments, such as can be secured by making and uniformly treating them independent of each other.

In some future article I may attempt to explain how, under a wise, skillful and thorough President and Board of Control, this department may be made an invaluable agent to secure the prompt and faithful collection and remission of the revenues of the road, and its exhibits at all times a true and reliable index, to the Board, of the operations of the road and the condition of the company's property.

#### Pittsburgh, Fort Wayne & Chicago.

The statement of earnings for the last six months of 1869 has been given heretofore in the Pennsylvania Company's report. President Cass makes the following detailed statement of earnings and expenses for the first six months in his recent annual report to the stockholders of the Fort Wayne Company:

Main line.....	\$3,965,007 68
Newcastle branch.....	73,272 08
Lawrence branch.....	5,688 95
Int. from C. & P. R. Co.....	6,943 75
 Total.....	\$4,050,852 58
Expenses main line.....	2,690,443 14
Newcas le branch.....	43,946 18
 Total.....	\$2,734,388 28
Income for six months.....	1,316,484 58

Which was appropriated as follows:

Interest on bonds.....	\$458,671 04
Dividend and taxes.....	676,184 30
The C. & P. R. Co. on division of earnings.....	134,616 68
Amount to income account.....	127,970 67

Total.....	\$1,316,484 58
For the last six months, during which time the road was operated by the Pennsylvania Company, under its lease, the earnings and expenses were as follows:	
Main line.....	\$3,950,409 10
Sixty per cent. of earnings of New Castle branch.....	73,518 53
Sixty per cent. of earnings of Lawrence branch.....	36,078 07
Sixty per cent. of earnings of Akron branch.....	79,908 77
Interest due from C. & Pitts. R. Co.....	6,943 75
 Total.....	\$4,146,332 28
Expenses of main line.....	2,143,145 69
Expenses of New Castle branch.....	38,476 83
Expenses of Lawrence branch.....	38,902 35
Expenses of Akron branch.....	68,631 33
 Total.....	\$2,777,878 18
Leaving a profit of.....	1,369,004 19
Amount paid and payable by the term of the lease.....	1,283,856 80
Due Cleveland & Pittsburgh R. Co. in division of earnings.....	39,360 75

Total.....	\$1,318,396 55
Excess of net earnings.....	
Being an apparent profit for the first six months of the lease of.....	535,677 54
535,677 54	

Nearly the whole earnings in excess of the rental were expended for permanent improvements and additional equipment. Ten new locomotives were built at an expense of \$78,918, and new freight cars which cost \$140,167.22.

Mr. Cass asserts that the amount of earnings was diminished by the policy of the Pennsylvania Railroad Company in diverting southward business from Chicago and eastward business from points south of Chicago to the Columbus Chicago & Indiana Central.

#### Central Pacific.

The company or capitalists who are largely interested in it, have purchased the San Francisco & San Jose Railroad, which extends from San Francisco in a southeasterly direction fifty miles to San Jose. There it is connected with the Western Pacific by a road about twenty miles long, and in connection with this forms the only entrance into the city of San Francisco for trains over the Central Pacific. By this route, however, the distance from San Francisco to Sacramento is 175 miles, while by Oakland (the regular route) it is only 135, and by Vallejo only 88 miles. The road is important as an inlet into San Francisco for roads from the south and southeast which may be built hereafter. It is said that the price paid for this road is \$8,500,000, or \$70,000 per mile.

The Central Pacific has also completed arrangements for taking its freight cars into San Francisco. This it does by a ferry boat which plies between the Alameda Landing, just east and across the bay from San Francisco, to Second Street. The distance is about five miles.

—The bill appropriating a million and a half to aid the construction of the Midland Railroad has been ordered to a third reading in the New York Assembly, and that giving the Adirondack Railroad \$10,000 per mile, and that aiding the Buffalo & Washington Railroad, and that giving the Whitehall & Plattsburg Railroad \$5,000 per mile, received the same action.

—The General Ticket Agents' Association assembled in New York last Thursday.

## General Railroad News.

## NEW AND OLD ROADS.

## St. Paul &amp; Sioux City.

This company is about to resume work on its main line southwest from Lake Crystal, with a view to its extension to St. James—22 miles—the present year.

## Peoria &amp; Rock Island.

This company, it is reported, is considering propositions from Jay Cooke and other capitalists to furnish money to iron and equip the road. Only a little while ago it was reported that the road had been mortgaged to J. Edgar Thomson and Charles L. Frost for this purpose. So what shall we believe!

## Fort Madison, Farmington &amp; Western.

A company with this name has been organized for the purpose of building a railroad from Fort Madison, Iowa, westward to Farmington and beyond. As far as Farmington, at least, its route is identical with the one most talked of for the Burlington & Southwestern. Judge J. M. Beck is President.

## Grand Rapids &amp; Indiana.

President Cass in his recent report announces that the contract made with this company by the Fort Wayne Company makes its construction certain and secures its through traffic for the latter road.

## Toledo, Ann Arbor &amp; Northern.

The Ann Arbor *Courier* says, that the directors have effected highly satisfactory arrangements with the Jackson, Lansing & Saginaw road by which that road, north of Owosso, can be used by their road.

## Lake Superior &amp; Mississippi.

The track is laid eighty-seven miles from St. Paul, and the road is graded thirty miles further. Upon the intervening fifteen miles from that point to Thompson, the point of junction with the Northern Pacific Railroad, nine hundred men are at work.

## St. Louis &amp; Cedar Rapids.

Wolf, Carpenter & Angle, contractors, have put their whole force on the extension of this road from northward. They expect to complete the road to Sigourney, thirty miles, within three months. The bridge for this road over the Des Moines at Ottumwa is just completed.

## Iowa Northern Central.

This road, which is the succession of the old Keokuk & St. Paul project, the stockholders propose to grade from Keokuk to Mount Pleasant, about 45 miles, before October, and lay the iron this year. Its course northward will be through Washington and Iowa City.

## Fox River Valley.

This railroad which is ready for the iron from Streator to Ottawa, and partly graded from Ottawa to Oswego, is now being located from Oswego, through West Aurora, to Geneva. There is talk of completing it to Aurora by the first of September.

## James River &amp; Kanawha Canal.

The Cincinnati Chamber of Commerce last week passed resolutions requesting the Governor of Ohio to call the attention of the Legislature to the project of completing the James River & Kanawha Canal to the Ohio river, and requesting the Legislature to memorialize Congress to order a survey of the proposed route by Government engineers, and that the Governor solicit the co-operation of the Governors and Legislatures of Kentucky and Indiana in favor of such survey.

## Erie Railway.

This company has commenced running a fast freight line between New York and Cincinnati, Louisville, St. Louis, Chicago, Milwaukee, and intermediate points. Freight is loaded into cars in New York city, and the cars are taken across the river in barges built for the purpose, and delivered at their destination without breaking bulk.

## Cairo &amp; Fulton.

The Senate Committee on Commerce has reported in favor of a bill extending the time of building this railroad. By the old law the company would soon forfeit its land grant.

## Pacific Railroad Junction.

This is fixed, by a bill which has just passed the Senate, at a point located northwest of the station at Ogden, and within the limits of Section 36, of Township 7, of Range 2, situate north and west of the principal meridian and base line in the Territory of Utah. The bill also grants to the company six additional sections, one section of land in each township being reserved for the benefit of schools in Utah, and these lands to be paid for at the regular Government price, \$2.50 per acre. If this bill becomes a law, Ogden will become comparatively unimportant.

## Peoria, Pekin &amp; Jacksonville.

The suit occasioned by the dispute concerning this road's crossing the Chicago & Alton's track at Jacksonville has been decided in favor of the former road.

## Hannibal &amp; St. Joseph.

This company, so a St. Joseph paper says, is considering the propriety and profit of buying what is known as the " Parkville grade " and building a line from Cameron to Leavenworth close to that which the Chicago & Southwestern is now building. This would give the company a line to Leavenworth and Leavenworth a direct route to Chicago.

## Lawrence, Junction City &amp; Denver.

A correspondent of the Lawrence, Kansas, *Tribune*, says:

This company is now fully organized, and on a working basis. The following named gentlemen are the Board of Directors: P. D. Ridenour, Geo. A. Reynolds, W. P. Montgomery, H. M. Simpson, G. W. Deitzler, C. W. Babcock, Elijah Sells, John W. Brown, C. C. Moore, Henry Schmitz, Guerdon E. Bates, J. H. Gilpatrick and Geo. W. Martin.

The projected route of the road is up the Wakarusa valley, up the Solomon, via Auburn and Junction City: thence to Denver, Colorado, with a branch to Evans, Colorado.

## Milwaukee, Manitowoc &amp; Green Bay.

The city of Sheboygan votes next Tuesday on the proposition to subscribe fifty thousand dollars to the capital stock of this company.

## Stockton &amp; Copperopolis.

From a Stockton, California, telegram of the 22d we learn:

"General Sullivan, President of the Stockton and Copperopolis Railroad, returned from the East to-day, and went to San Francisco. It is confidently expected that he has perfected such arrangements as will enable that company to commence operations at an early date.

## Southern Pacific of California.

This company, has filed articles of incorporation at Sacramento. It intends to build a road from San Francisco to San Diego, and connect with the proposed Memphis, El Paso & Pacific Railroad, or such other road as may be built across the continent to San Diego. General Rosecrans is President of the company.

A telegram from Gilroy, California, of the 22d, says:

"A party of civil engineers in the employ of the Southern Pacific Railroad arrived in this place this evening. They are supplied with camp equipments, and will start on an exploring trip in a few days. Nothing definite as yet can be learned as to which route the railroad will take from this point. That the railroad terminus will not long remain here seems a certainty."

## Louisville, New Albany &amp; Chicago.

This road is now running thirteen daily trains, and has all the business its rolling-stock is equal to.

## Chesapeake &amp; Ohio.

The directors of the road have lately let contracts for the construction of sections of their road, amounting altogether to \$3,000,000. These contracts, it is said, cover the heaviest work on the line.

## Allegan, Holland &amp; Muskegon.

The Kalamazoo *Gazette* says that Messrs. Goss, Warren & Co., are piling up stacks of iron rails at Allegan, and the cars will run through to Muskegon, early next summer.

## Goshen &amp; Warsaw.

A part of the rails have been purchased for this section of what will be a southern extension of the Lake Shore & Michigan Southern's line from White Pigeon to Grand Rapids, and it is intended to complete it early in the summer.

## Tebbe &amp; Neosho.

The directors met at Boonville, Missouri, on the 24th ultimo and awarded contracts for the construction of that part of the road between Sadalia and Fayette, *via* Boonville, to Captain Henry McPherson and others.

## Osage Valley &amp; Southern Kansas.

At a meeting of the directors on the 24th ult. J. P. Ross was elected a director, a subscription from Morgan county, Missouri, was received, and the Superintendent was instructed to proceed at once to build the section of twenty-five miles between Tipton and Warsaw. It is expected that the entire line from Boonville to Warsaw will be in full operation within the next twelve months.

## Belleville &amp; Southern Illinois.

This company has had a route for its line surveyed through Sparta.

## Worcester &amp; Nashua.

The directors have voted to sell 1,550 shares of the capital stock now owned by the company. The stock is offered to stockholders at \$100 per share, in the proportion of one new to ten old shares. The proceeds are to be expended on the road.

## Decatur &amp; East St. Louis.

J. C. Prescott & Co., of Edwardsville, the contractors, expect to finish the road within two months. The road bed is now ready for the iron.

## Pittsburgh &amp; Connellsville.

—Mr. Ruff, contractor of the first ten miles of the Pittsburgh & Connellsville Railroad, from Connellsville, Pa., will have his contract finished by the 1st of July next, and trains will be running to Indian Creek. That portion finished is an excellent piece of road.

## Chicago &amp; Southwestern.

This road has been put under contract from Platte City, its present terminus, eight miles northeast of Leavenworth, to Plattsburg, twenty miles further.

## Kansas Pacific.

Trains are now running regularly between Kansas City and Carson, a distance of 487 miles. This greatly diminishes the distance to be traveled by stage in making the journey to Denver by this route. A fine line of four-horse Concord coaches connects at Carson for Denver and the interior of Colorado, and the journey from Kansas City and Leavenworth is now made in less than fifty hours. Pullman sleeping cars are run upon night trains, and provision is made to render the journey over this road attractive to the travelers and immigrants who are making their way in great numbers to the interior of Kansas and Colorado. Close connections are made at Kansas City with trains from the East.

The extent of the first two divisions of the road has been determined. Wamega, 104 miles from Kansas City, will be the terminus of the first; and Brookville, 84 miles further west of the second. The building of round-houses at these places has been commenced, and repair shops will be put up this season.

## Chester &amp; Tamaroa.

The company has had a preliminary survey made from Tamaroa to Pinckneyville, Illinois, as a basis for a contract.

## Cairo &amp; Columbus.

The Mobile *Register* chronicles the arrival of John M. Douglas, President, and Marvin Hughitt, General Superintendent, of the Illinois Central Railroad, in that city and says:

"It is understood that the visit of these gentlemen is with reference to filling the gap between Columbus, Ky., and Cairo, Ill., thereby establishing railroad connection between the Northern terminus of the Mobile & Ohio road and the Southern terminus of the Illinois Central. This done, and there will be a continuous line of railroad from Mobile to Chicago, which is of immense advantage to Mobile and a long step toward placing this city in the position of commercial eminence to which it is, by its geographical situation, entitled. The well known energy of the gentlemen who have come here on this business, affords a guarantee of the success of the project."

## Grand Rapids &amp; Indiana.

A telegram from Fort Wayne says that tracklaying has commenced on this road at Sturgis, Mich., and is progressing towards Fort Wayne. It will be commenced at Fort Wayne also. Mr. J. L. Williams, Receiver of the road, expects, with favorable weather, to have a train running from Fort Wayne to Sturgis, fifty-six miles, by the latter part of May. The iron is received at both ends as fast as it can be laid.

## St. Joseph &amp; Denver.

We learn from the Fort Kearney *Star* that Colonel Whitney, engineer of this railroad, is at Kearney Station, on the Union Pacific Railroad, with a party of surveyors, to survey the line from Kearney to Marysville, Kansas. Another engineer party, under Major Robinson, are surveying westward between Kearney and the Big Sandy, and are expected at Kearney in a few days. The road is already completed to Hiawatha, Kansas, and the work still progresses rapidly towards Kearney.

## California &amp; Oregon.

We learn from a California telegram of the 20th that the working forces on this road have commenced operations at Chico, as well as at the point where the work was suspended last fall, the two parties working toward the centre. It is said that the road will be finished to Chico in about six or seven weeks.

## South Pacific.

The track was completed to Webster county, 218 miles from St. Louis and about 20 miles beyond Lebanon, on the 30th ult. The builders are confident of reaching Springfield by the 1st of May.

## Chesapeake &amp; Ohio.

At a recent meeting of the directors held in New York, contracts were awarded for all the principal work on the extension to the Ohio river at rates more favorable by twenty to twenty-five per cent. than the engineer's previous estimates. The following parties were awarded contracts: C. R. Mason, Dundam & Bendinger, Robert Harvey, Kelley & McMahon, McMahon & Son, McMahon, Green & McMahon, C. L. DeHane, W. R. Johnson, Jr., H. Cady, B. A. Warthen, L. B. Vaughn, McMian, Burke & Co., J. M. Keesee & Co., J. Kinsley, Haskins & Cavanagh, Myers & Donaghy, Hubbard & McCurdy, Falloon & Carrier, A. H. Wilson, J. J. & F. Powers & Co., Kerr & Myers, C. Snyder & Co., W. W. Gates, Bibb & Tablee, Lee & Huston.

## Baltimore &amp; Ohio.

The general assembly of Maryland has released this company from the further payment of the capitation tax on the Washington Branch Railroad, amounting to one-fifth of the gross receipts from passengers, provided that all arrearages due to the State by virtue of the act of 1832, chapter 175, up to the passage of the act for release, shall be settled and paid up to the entire satisfaction of the Assembly.

## Leavenworth, Lawrence &amp; Galveston.

Twenty gangs of men are grading between Iola and Humboldt, and more than a thousand men between Garnett, the present terminus, and Deer Creek.

## Mississippi Bridge at Alton.

Representative Coburn, of Indiana, has introduced into Congress a bill which provides that it shall be lawful for the Alton & St. Charles Bridge Company to construct and maintain a toll bridge from any point in Madison county to any point opposite on the Mississippi river, in Missouri, and to place tracks on it for all railroads, and to allow them to cross the bridge for reasonable compensation to the owners thereof; and in case of any litigation arising from any obstruction or alleged obstruction to the navigation of the river, the cause may be tried before the District Court of the United States of either State in which any portion of said bridge touches. Any bridge built under the provisions of this act shall not be in any case of less elevation than 50 feet above extreme high-water mark, as understood at the point of location, to the bottom chord of the bridge: nor shall the spans be less than 250 feet in length in the clear, and the piers of said bridge shall be parallel with the current of the river, and the main span shall be over the main channel of the river at low water. The bridge is to be a post road of the United States, and the right to alter or amend this act so as to prevent or remove all material obstructions to the navigation of the river by the construction of bridges is expressly reserved.

## Iowa Southern.

According to the Davenport *Gazette* it is proposed to build this road from "Alexandria in Missouri, opposite Warsaw in Illinois, these places being just below Keokuk, and almost near enough to be suburbs. From thence it pursues a course a little north of west 42 miles in Missouri, then entering Iowa, after 53 miles more it reaches Centreville, the County seat of Appanoose county. The route then is directly west through the county towns of the southern tier to the Missouri river, and its intended termination is at Nebraska City. The connection of the road with the East will be very direct by means of the Toledo, Peoria & Warsaw Railroad, and because of its southern deflection from Centreville and striking the river below the Rapids, it forms a splendid and most desirable route to St. Louis. The iron will be laid from Alexandria to Centreville this year."

## Mississippi &amp; Missouri River Air Line.

The editor of the Canton (Mo.) *Press* has seen the contract as closed with Messrs. John Fallon and associates, of Philadelphia, Penn., for the iron, rolling stock, &c., for this railroad.

"The contract stipulates that the iron is to be laid and the cars running to Canton by the 4th of July next, and to Memphis by the 1st of January, 1871. The contract also includes the building of the bridge over the Wyoconda above LaGrange and one over the same stream west of Canton."

This road is to extend from West Quincy up the Missouri 15 miles to Canton, and thence northwest as far as Memphis and Lancaster, Mo., crossing the North Missouri near the Iowa line.

## Wisconsin Railroads.

The Janesville *Gazette* gives the following list of railroad companies chartered at the late session of the Wisconsin Legislature:

Madison & Portage; Baraboo Air Line; Sugar River Valley (act revived and amended); Green Bay & New London; Milwaukee & Northern; Lone Rock, Richland Center & Pine River Valley; Madison, Monroe & State Line; Milwaukee & Rockford; Portage, Stevens Point & Superior; Berlin, Weyauwega & Lake Superior; Portage, Friendship, Grand Rapids & Stevens Point; Union, Trempealeau Valley, Black River Falls, & Neillsville; Evansville & State Line; West Bend; Prescott, River Falls & Eastern; Chippewa Valley & Lake Superior; Janesville & Evansville; Wisconsin Northern; Superior; & St. Croix.

The *Gazette* says that "taking into the account the lines already constructed, we estimate that there are now chartered not less than thirty-five hundred miles of railroad in Wisconsin."

## Boston &amp; Albany.

The directors have voted that stockholders of record March 2, 1870, will be entitled to receive one new share of the capital stock of said company for every five shares held by them, respectively, on the payment of \$100 per share, fifty per cent. of which must be paid on or before April 1, 1870, and the balance on or before October 1, 1870. This increases the capital stock \$3,200,000, and raises the whole capital to \$19,700,000. The principal object is the payment of the temporary loan to Messrs. Baring Brothers & Co. of London of \$250,000, the balance being for construction account. By Legislative Act, approved June 23, 1869, the company are further authorized to issue stock to the amount of \$8,000,000.

## San Joaquin and Southern Pacific.

Governor Haight, of California, has vetoed the bill granting aid to this road.

## The Baltimore &amp; Ohio, Toledo &amp; Michigan.

This company has filed a certificate of incorporation at the office of the Secretary of State of Ohio. The company is organized for the purpose of constructing a railroad from the city of Mansfield, Ohio, to the boundary line between the States of Ohio and Michigan. The road will pass through the counties of Richland, Crawford, Huron, Seneca, Sandusky, Wood and Lucas, and also through the city of Toledo. Capital \$1,500,000, in shares of \$50 each. The corporators are Samuel M. Young, John Fitch, Richard Mott, Valentine H. Ketcham and Valentine Braun. This road is said to be a project of the Baltimore & Ohio Railroad Company.

## Memphis &amp; Little Rock.

That part of the road between Little Rock and Duvall's Bluff, which has been leased and operated for some years by the Arkansas River Packet Company, reverted to the railroad company on the 8th ult. and will be operated by it hereafter.

## Brunswick and Albany.

The track was laid past the fifteenth mile-post on the 15th ult. It has been put down in a great hurry. The completion of so much of the road secures the State's endorsement of \$750,000 of its bonds.

## Quincy, Missouri &amp; Pacific.

The annual meeting was held on the 21st ult. The following persons were elected as officers of the company for the present year: E. A. Savage, President; J. W. Blackburn, Vice President; Geo. S. King, Secretary; C. H. Bull, Treasurer. On the 26th the President made his report. The preliminary survey was completed on the 15th of last December. The route was found favorable. The right of way has been obtained and deeded to the company free of cost, for sixty-five miles of the route between West Quincy and Kirksville.

The grading of sections one, three, four and five, extending (with the exception of a mile) from West Quincy to the Fabius river beyond Taylor's, has been put under contract to be finished by the 1st of June next. Section two will be let on the 26th inst., to be completed by the 1st of June also. The grading on the work already let is progressing rapidly. As early as the 1st of May it is expected that thirty or forty miles of additional work will be ready to put under contract. It is expected that the work of grading on the west end of the road, from opposite Brownville, Nebraska, across Atchison county, will be put under contract next month, or, so soon as the bonds of the city of Brownville can be made available, and subscriptions are voted upon in Phelps, Rockport and Tarkeo townships, Atchison county.

The amount of stock already subscribed by cities, counties and townships is \$1,499,000. It is expected that about \$800,000 more will have been subscribed by the 1st of May.

## Springfield &amp; Illinois Southeastern.

The company has received \$25,000 in bonds from Gallatin county, \$20,000 from Christian county, and \$11,000 from three townships. Thomas S. Ridgway, the President, has been negotiating in Cincinnati for a corps of workmen to complete the road from Shawneetown through Gallatin county. For the part of the line between Springfield and Pana new cars and locomotives are arriving. Work is progressing favorably in Clay county north of the Ohio & Mississippi.

## Pensacola &amp; Louisville.

This road, which extends towards and not to Louisville from Pensacola, has trains running regularly between Pensacola, Fla., and Pollard, just north of the Alabama line, where it connects with the Mobile & Montgomery Railroad for Montgomery and the North and East.

## ELECTIONS AND APPOINTMENTS.

D. Torrey, the genial and accomplished Pittsburgh Superintendent of the Central Transportation Company, under the Pullman management remains in charge of the Pennsylvania Railroad line with the title of Assistant Superintendent. His headquarters are at Pittsburgh. Mr. Torrey is as thorough a business man as can be found on any railroad.

On the 23d ult. the Board of Directors of the Milwaukee & Northern Railroad Company elected the following officers: O. H. Waldo, President; R. R. Ober, Vice President; Executive Committee—O. H. Waldo, R. R. Ober, Angus Smith, E. D. Holton and Guido Pfister.

B. M. Tiffany, for twelve years foreman of the passenger car shop of the Chicago, Burlington & Quincy Railroad, in Aurora, has resigned his position, and accepted one as Assistant Superintendent of Construction for the Pullman Palace Car Company. His friends in the Aurora shops made him a present of a fine watch worth \$180.

The Sturgeon Bay and Fond du Lac Railroad Company, of Wisconsin, has organized, with the following

officers: President, R. C. Tate, of Racine; Vice President, A. W. Lawrence, of Sturgeon Bay; Secretary, R. M. Wright, of Sturgeon Bay; Treasurer, H. Harris, of Sturgeon Bay; Executive Committee, George Pinney, of Sturgeon Bay; C. L. Harris, of Jacksonport; John Boyd, of Fond du Lac.

W. E. Bridges has been appointed agent and operator of the Union Pacific Railroad, at Miser Station, Wyoming. Joseph Christie, formerly agent at Miser Station, has accepted the agency for the same road at Como, Wyoming.

At a meeting of the stockholders of the Sheboygan & Fond du Lac Railroad, held a few days since, the following officers were elected: President and Superintendent, S. W. Barrett; Vice President, A. G. Buggles; Secretary, Edwin Slade; Treasurer, F. R. Townsend.

The Directors of the Missouri Pacific met on the 29th ult., and according to the telegraphic report, Hudson E. Bridge was elected President and Thomas McKissock recalled as General Superintendent. Mr. Robert Hale, the late Superintendent, had held the position but a few months. The changes are the result of parties among the stockholders.

## PERSONAL.

Charles Vignoles, one of the most distinguished of railroad engineers, has been elected President of the Institute of Civil Engineers of England. The New York *Technologist* says of him: "In him is represented the connecting link of the present and the past phases of the art of civil engineering. He was one of the earliest railway engineers, and his works were marked by extraordinary economy and despatch. In Europe he laid the first line of railway in Austria, Prussia and Russia. His suspension bridge over the Neva is one of the grandest works of the kind. Vignoles was also a pioneer of railways in South America. He was the first to substitute the Trail for the double-headed rail. Indeed, this form of rail on the European Continent is called the 'Vignoles.' His extensive practice has, of late years, been carried on by his son; but his almost cosmopolitan reputation still remains, and his opinion upon engineering questions is eagerly sought at all times, and from all quarters. His association in his youth with the famous Professor Hutton has engrained in him a predilection for mathematics which has greatly assisted his engineering career."

The following is the order announcing the appointment of Mr. A. J. Cassatt as Superintendent of the Pennsylvania Railroad, issued by President J. Edgar Thomson, under date of March 23, 1870:

Edward H. Williams having tendered his resignation, A. J. Cassatt is hereby appointed General Superintendent of the Pennsylvania Railroad, to take effect April 1, 1870. He will organize and conduct the business of his department in accordance with the 'Revised Organization' for conducting the business of the company."

A Dr. Strausberg, now of Berlin, but formerly a journalist in New York, owns all the railroads of Roumania.

President Cass, in his report to the stockholders of the Pittsburgh, Fort Wayne & Chicago Railway, says of Mr. J. N. McCullough: "It is right to add that the General Manager, on behalf of the lessee, managed the property with zeal, ability and judgment, looking to the permanent interest of the property, as well as to immediate favorable results for the lessee."

## MECHANICS AND ENGINEERING.

On the night of the 24th ult. four spans of the Central Pacific Railroad bridge over the American river at Sacramento were burned. Arrangements were made immediately for ferrying passengers and baggage, and within three days a temporary bridge was completed, so that trains can now run through to San Francisco as before.

Mr. H. Blackstone, the Chief Engineer of the Allegheny Valley Railroad, in a recent report to the company gave the following account of an experiment with really good iron rails:

"In regard to the durability of iron rails I have never seen a rail perfectly homogeneous worn out; neither have I ever heard any civil engineer say that he had, and I have frequently asked the question. In speaking of these things to a prominent iron manufacturer of this city (Pittsburgh), he kindly proposed to furnish to this company a couple of iron rails made from his common merchant bar. These were received and laid on the track in March 1868, and on the opposite side of the track were laid steel-headed rails, manufactured in Michigan. Both were laid at a point where it was supposed they would receive the roughest service. In less than six months some of the steel rails were given out, and shortly after they were lifted and Brady's Bend rails supplied. These were worn out and others supplied and worn out, while the two rails furnished by the party above referred to remain in the track apparently little the worse of the service."

## LOCOMOTIVE STATISTICS.

Chicago, Burlington &amp; Quincy.

C. F. Jauriet, Superintendent of Machinery of this railroad, reports for the month of January, 1870, as follows:

Miles run on passenger trains.....	87,893
" " Freight trains.....	11,292
" " Miscellaneous trains.....	98,335

Total number of miles run.....	207,450
Average cost per mile for repairs.....	11.18 cts.
Average cost per mile for oil and waste.....	.98 cts.
Average cost per mile for fuel.....	9.18 cts.
Average cost per mile for engineers, firemen and wipers.....	1.78 cts.

Total cost per mile run.....	.98.97 cts.
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The average number of miles run was:

To one cord of Wood.....	43.45
" " ton Coal.....	50.19
" " pint Oil.....	15.12

Wood is rated at \$6 per cord and coal at \$4 per ton, loaded on tenders. One pound of tallow is rated as one pint of oil. The number of locomotives reported is 151. Of these seventeen made no mileage during the month, six were rebuilding, eight undergoing general repairs and three light repairs in the shops.

Toledo, Peoria &amp; Warsaw.

The following is the report of the general average of performance of locomotives on the Toledo, Peoria & Warsaw Railway for the month of February, 1870, as made by A. H. DeClercq, Master Mechanic:

Cost per mile for engineers, firemen and wipers.....	7.30 cts.
Cost per mile for repairs of engine.....	7.46 "
Cost per mile for oil, waste, tallow and rage.....	1.44 "
" " fuel.....	7.17 "

Total cost per mile run.....	.93.37 cts.
Miles run to pint of oil.....	11.97

The above includes all kinds of oil consumed and superintendence, and all other expenditures appertaining to repair of locomotives.

Average cost of oil \$1.05 per gallon. Coal is charged at \$2.75 per ton, and wood at \$4 per cord. Whole number of engines 45, of which 11 made no mileage.

## TRAFFIC AND EARNINGS.

The Missouri Pacific Railroad reports its business for the year ending February 28, 1870, as follows: Passengers, \$1,397,545.16; freight, \$1,689,307.66; express, \$62,640.85; mails, \$52,037.52. Total \$3,211,531.19. The increase over the previous year was \$119,939.68; net earnings, \$886,153.89. The road has now in use 1,111 cars of all descriptions, and fifty-seven locomotives, also forty-one locomotives which are being changed from broad to narrow-gauge. The figures were telegraphed, and may not be exactly correct. The increase of about 3% per cent. is very satisfactory, considering the competition of the North Missouri, a new route, for through business.

The earnings of the North Pennsylvania Railroad in the fiscal year ending October 31st, 1869, were \$1,132,731.14. Derived from passengers, \$880,379.53; coal, \$347,258.42; pig iron, \$51,637.95; through lumber, \$27,981.33; miscellaneous local freight, \$261,410.70; miscellaneous through freight, \$141,779.21; mails \$4,800; rents, etc., \$8,484; total, \$1,132,731.14.

As compared with the fiscal year ending October 31st, 1868, they show a total increase for the year of \$117,336.85.

The proportion of expenses to earnings has been fifty-six per cent. and fifty-two hundredths, which is a little less than in the preceding year.

The Louisville & Nashville Railroad is now shipping all the freight that is offered: sending South from ninety to one hundred and fifty loaded cars daily.

The Baltimore & Ohio Railroad Company reports the following comparative statement of earnings for the years ending September 30, 1868 and 1869, for the main line, including the Winchester & Potomac and the Washington County Branch:

Earnings	1868.	1869.
From passengers.....	\$1,451,513.60	\$1,946,919.48
Tonnage.....	6,107,131.91	7,477,000.26
Total.....	\$7,558,644.51	\$8,394,915.74
Working expenses.....	\$5,054,448.73	\$3,756,106.46

Net earnings.....	\$2,504,195.78	\$3,638,809.28
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The earnings, in comparison with the fiscal year 1868, have increased \$1,166,271.23, and the working expenses \$701,657.73—making a comparative increase in net profits of \$464,613.50. Compared with the fiscal year 1867, the increase of earnings being \$1,282,231.64, and the increase of working expenses \$1,379,840.60, the decrease of net profits amounted to \$97,608.96. The ratio of expenses to earnings was in 1867, 58.79; in 1868, 66.86, and in 1869, 65.97.

The Western Union Telegraph Company reports as follows for January:

	Jan. 1870.	Jan. 1869.
Gross Receipts.....	\$543,933.69	\$606,051.90
Expenses.....	406,631.08	349,575.70

Net Profits.....	\$135,907.61	\$256,473.21
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Showing a decrease of about ten per cent. in gross and of forty-seven per cent in net earnings.

The earnings of the Marietta & Cincinnati Railroad for the years ending December 31, 1868 and 1869, were as follows:

	1868.	1869.
From Passengers.....	\$639,373.46	\$833,316.03
" freight.....	844,529.25	939,461.26
" mail.....	28,737.41	15,137.44
" express.....	48,718.49	35,454.01
" telegraph.....	7,798.49	6,235.83
Expenses.....	\$1,264,687.13	\$1,391,345.65
Net earnings.....	\$170,469.77	\$147,081.32

Compared with the previous year the gross earnings show an increase of \$103,258.58; with an increase in expenses of \$126,046.98—making a decrease in net earnings of \$22,788.45.

## MISCELLANEOUS.

Cincinnati asks that Ohio may have a law to enable municipalities to vote aid to railroads, similar to that under which Illinois is building so many hundred miles of railroad.

It is reported that the contractors who are to build the remaining section of forty miles of the New York Midland Railroad will import 1,000 Chinese to do the work, employing them for five years, at ten dollars a month and rations.

It is reported that the plans for building railroads from Kansas south through the Indian Territory are likely to be interrupted by the hostility of the Cherokee, who are bitterly opposed to the proposed act of Congress, forming a territorial government for them, and are indisposed to foster any closer communication with the whites.

A telegram from Salt Lake dated March 25 says: "John Sharp has just returned from Sacramento, having effected a settlement with the Central Pacific Railroad for work done on the construction of the road at Promontory by Benson, Farr & West, contractors, the railroad company paying \$100,000. Although this amount does not cover all the claims, it is more than was expected from indications a short time since, and will save several contractors from pecuniary embarrassments."

A Coroner's jury in St. Louis has brought in a verdict that one Louis Baum, who had been a workman in the air-chamber under the pier of the St. Louis Bridge, while it was sinking, died of congestion produced by the great pressure of air—about forty pounds to the square inch. A telegram says: "There are some thirty men at the hospital suffering more or less from the effects of working in the air-chamber, and quite a number under treatment at the hospital of the Bridge Company."

Michigan passed a general enabling act about a year ago, authorizing the various municipalities of the State to vote aid to railroads in proportion to the assessed value of their property, the bonds given for aid to be filed with the State Treasurer. Up to the 25th ult. the bonds thus filed amounted to \$2,850,000.

In loading the cars of the Dayton & Michigan Railroad with ice, the power of steam is applied directly to the frozen surface. A train of cars is backed up to a curve near the shore of the river or pond, a rope is extended from the locomotive to the largest sized ice-cakes, and the latter are dragged up by the motion of the locomotive on the track. Thus six cars are loaded per hour.

A car ran off the track of the North Missouri Railroad not long ago, and a number of the passengers, none of whom were hurt, united in an address to the directors of the company, advising them to put the track into better order, said address looking very much as if drawn up by an agent of some rival line. Where a company is actually at fault, this may prove an effective method of waking it up; but as long as railroad agents are unscrupulous, it is a dangerous weapon.

The London *Times*, in a discussion of the recent surveys for the Darien Canal, doubts whether such a canal would be worth what it would cost.

A bill has passed the Iowa House of Representatives, and is now pending in the Senate, which provides for a tax of one per cent. on the gross earnings of all roads whose receipts exceed \$4,000 per mile, two per cent. on all gross earnings between \$4,000 and \$6,000 per mile, and three per cent. on all gross earnings of over \$6,000 per mile. Four-fifths of this tax is to be assigned to the counties, proportioned to the number of miles of road in each county; the remaining one-fifth goes into the State treasury, to be applied to the usual purpose of State taxes.

A London company is building a railway somewhere in South America, and photographs of the completed portions of the road have to be sent to London as vouchers for the work done by the contractors, before they can receive the successive instalments of their pay.

A writer who has had considerable experience on our railroads, suggests that in sleeping cars there should

be a separate toilet for the ladies, and that there should be a stewardess for the car as well as a steward. The suggestion is a good one. Where perfection has been so nearly reached, it is a pity not to go a step further and secure it. It may be said that those who are fastidious can take a drawing-room. But drawing-rooms are not always to be had, and, moreover, it is an additional expense, while the expense of the sleeping-car is sufficient to warrant a comfort, which, it may be said, decency requires.

On the 1st ult. a grand banquet took place at the engine-factory of Messrs. Sigl, near Vienna, on the occasion of the completion of 1,000 locomotives at that establishment. During the fete Herr Sigl was presented by the Mayor of Vienna with the freedom of the city. One of the locomotives, named the "Elisabet" (Elizabeth), is destined for the special train which carries the Empress of Austria when she proceeds from Pesth to her country estate of Godollo.

A company has been organized at Romeo, Michigan, for the purpose of establishing car shops there.

All the conductors on the Union Pacific Railroad are to be clothed in a blue uniform, consisting of pants, vest and coat, business suit made of dark blue heavy cloth, ornamented with brass buttons. The design of the buttons is unique, with an elk in the center, and around the face are the words "Union Pacific Railroad."

The Great Western Telegraph Company have been constantly at work during the winter. Their poles now reach from Chicago to within twenty-five miles of Lincoln, the capital of Nebraska. Wiring west is progressing daily, and Omaha will be reached in about fifteen days. The company are also planting their poles on the Chicago, Burlington & Quincy Railroad.

The St. Paul *Press* of the 29th ult. publishes the correspondence between Allen Melville, of New York, a holder of a portion of the repudiated Minnesota State bonds, with General B. F. Butler. Melville states that as Minnesota is rich, but won't pay and won't arbitrate, and won't consent to be sued by the bondholders, there is but one other way—have her sued by another State of the Union. He asks Ben Butler if Massachusetts, for the honor of the whole American people, will accept a respectable amount of the bonds for some charitable purpose, and make an example of this great Northwestern republic. If she will, he says he thinks he can procure the gift to be made for that purpose. Butler replies that most probably Massachusetts would accept an amount of \$100,000 or over of bonds for the support of her State charities, and undertake to collect them by suit.

## Northern Packet Line.

The St. Paul *Press* gives the following account of the preparations made by the Northern Line Packet Company for the business of the coming season:

The company has three splendid new packets ready to put into the trade. They are the Lake Superior, which is 247 feet long, 38 feet beam, and with a carrying capacity of 800 tons; the Red Wing, 245 feet long, 36 feet beam, and a carrying capacity of 700 tons; the Rock Island, 230 feet long, 36 feet beam, and a carrying capacity of 600 tons.

These have all been built in the vicinity of, and finished at Pittsburgh, and are as fine, fast, well furnished and as thoroughly equipped boats as have ever run the western waters.

The following are the assignments of boats to the various trades, with the officers of each boat as far as known.

ST. LOUIS AND ST. PAUL.  
Lake Superior—Commander, Jonas Wordan; First Clerk, L. C. Grinnell; Second Clerk, Wm. Wells.  
Red Wing—Commander, W. P. Hight; First Clerk, P. Flannigan; Second Clerk, Theodore Jones.  
Dubuque—Commander, James Ward; First Clerk, D. V. Dawley; Second Clerk, T. H. Ward.  
Minneapolis—Commander, T. B. Hill; First Clerk, C. D. Carroll; Second Clerk, C. Gregg.  
Minneapolis—Commander, George W. Jenks; First Clerk, W. W. Van Dyke; Second Clerk, R. Jones.  
Muscatine—Commander, M. Green; First Clerk, E. Lee Brady; Second Clerk, A. Delaney.

DUBUQUE AND ST. PAUL.  
Davenport—Commander, B. A. Conger; First Clerk, A. Hawlin; Second Clerk, Geo. Dodge.  
Sucker State—Commander, —; First Clerk, M. B. Pierce; Second Clerk, —.

BETWEEN RAPIDS.  
Rock Island—Commander, Jas. Campbell; First Clerk, A. Parkhurst.  
New Boston—Commander, R. Melville; First Clerk, Charles Mather; Second Clerk, —.

DUBUQUE AND DAVENPORT.  
Bill Henderson—Commander, —. Lytle; Clerks (not known here).

ST. PAUL AND ST. CROIX.  
James Means—Officers not appointed.  
The following boats are held in reserve, to be used whenever needed during low water:  
Savanna, Reserve, Keithburg, Pembina, and Charley Cheever.  
TOW BOATS.  
Petrel, Little Giant, Dan. Hines, and Ironsides. These, with the use of barges, will be enabled to transport an immense amount of grain and other freights.

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479, 481 & 483 STATE ST., CHICAGO.  
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**RAILWAY CAR TRIMMINGS,**  
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**Removable Globe Lanterns.**

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This Company is by law and by the order of the Supreme Court made a legal depository of money. It will act as Receiver in cases of litigation, take charge of, and guarantee the safe keeping of all kinds of Securities, and collect coupons and interest thereon.

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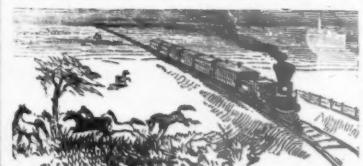
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Roofing Pitch, & Felting,

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### PIERCE'S ELASTIC RENEWABLE

## Railway Frog and Crossing.

FIG. 3



FIG. 1



FIG. 2

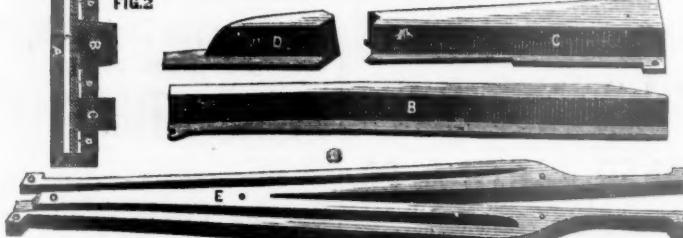


FIG. 1.—A. Permanent Bed Plate, Cast Iron.  
B.B. Guard Rail, Cast Iron, wearing surface chilled, (can be made of steel if preferred.)  
C. Base of point, Cast Iron, with chilled surface, or Steel.  
D. Point, of Cast Steel.  
E. Cap, of either Cast or Wrought Iron.  
FIG. 2.—Cross Section. A. Bed Plate. B. Base. C.C. Guard Rails. D.D.D. Cap. E. Wood packing half-inch thick. F.F.F. Wood packing, quarter-inch thick.  
FIG. 3.—Shows the Frog complete, with all its parts adjusted ready for laying down.

**THE ADVANTAGES** claimed for this Frog are in brief: **First**—The permanency of the bed plate, on which there is no wear. **Second**—The durability of the Guard Rails, base and point, and the ease with which they can be renewed. Also, the elasticity which is given by the packing, avoiding the rigidity of the Solid Frog. **Third**—The bed plate being once in position, does not require to be taken up to produce a new Frog, as the wearing surfaces (Guard-rail, base and point) are renewable at pleasure. **Fourth**—The Cap is adjustable and easily removed for the purpose of renewing any of the worn parts, and can be done in ten minutes time by two men. The Guard-rails, point and base, being held in position and fastened by the Cap. By this device a new Frog is produced at about one-third the original cost. **Fifth**—It is no necessary to take up or move the connecting rails with the Frog for the purpose of renewal. It does away with the interruption to passing trains and the labor incident to replacing the old form of Frogs. Many other points of excellence and economy might be adduced which it is deemed necessary to enumerate, believing that a practical examination or test by Railroad Managers will bring out its qualities and prove its use and value.

### PRICE LIST.

[POINT OF CAST STEEL, BASE AND GUARD RAILS OF CHILLED IRON SURFACE.]

No. 1. - 6	Foot Frog about 7 degrees,	\$85.00	{	Base, \$8 each.
" 2. - 5½ "	" " 8 "	\$85.00	{	Point, \$10 each.
" 3. - 5 "	" " 9 "	\$82.00	{	Guard Rail, \$8 each, or Full Set, \$30.

Other sizes that may be desired, or renewable parts of Cast Steel, furnished at proportionate rates.

**SHERMAN, MARSH & STEEL, Manufacturers and General Agents,**  
**OFFICE, 91 WASHINGTON ST.,**

CHICAGO, ILLINOIS.

## OMNIBUSES

EVERY STYLE!

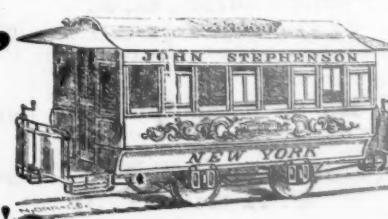
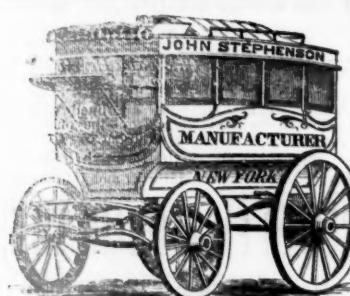
Orders Promptly Filled.

## CARS,

LIGHT, STRONG

— AND —

ELEGANT!



## Important to Railway Companies!

The following, which we take from one of our exchanges, is but an illustration of how much money railroad companies are and have been paying for the old-style baggage-check, and how easy it is for them to daily purchasing baggage-checks, until they amount to millions ere they are aware of the fact:

"*A Rash Promise.*—A paper tells the following story of a young lady who is a pupil at one of the schools in this city, and who has already, it seems, beaten her father at mathematics. She modestly proposed that if her father would give her only one cent on one day, and double the amount on each successive day for just one month, she would pledge herself never to ask of him another cent of money as long as she lived. Father-families, not stopping to run over the figures in his head, and not supposing it would amount to a large sum, was glad to accept the offer at once, thinking it also a favorable opportunity to incite a possible marriage dowry in the future. At the twenty-fifth day, he became greatly alarmed, lest, if he complied with his own petition, he might be obliged to be 'declared a bankrupt on his own petition.' But at the thirtieth day, the young girl demanded only the pretty sum of \$5,365,719 12. The astonished merchant was only too happy to cancel the claim by advancing a handsome payment for his folly in allowing himself to give a bond—or his word he considered as good as a bond—without noticing the consideration therein expressed, and by promising to return to the old custom of advancing smaller sums daily until otherwise ordered."

In comparing the above with the cost of baggage-checks, it is well known by every baggage-man that to supply a road perfectly with checks, it is necessary that the baggage should have on it a check which of itself, indicates the station for which the baggage is destined; if it has not, the baggage-check is not perfect or complete. As every intelligent person can conceive at a glance, to bring the checking of baggage to such a state of perfection with the old style of baggage-check would cost an immense amount of money, as per example: We will take the New Jersey Railroad; we will say that it has twenty stations; it will require one thousand checks from New York to Newark, one thousand from New York to Elizabeth, one thousand from New York to Rahway, one thousand from New York to New Brunswick, and so on to the whole twenty stations. Then we again commence with one thousand from Newark to all stations, one thousand from Elizabeth to all stations, and so on until all stations are supplied, then we have just commenced; as other stations are added, and other connections made, all this must be done over and over again, and there is no help for it so long as railroad companies continue to use the old-style check and system of checking baggage. The next question is, how to obviate the necessity of purchasing this immense amount of baggage-checks? Simply by adopting the Thomas Safety Baggage-Check and system of checking baggage. By its use, it matters not how many different stations are opened, or how many connections are made, the one check will go to every one of them, and, by so doing, save tens, if not hundreds of thousands of dollars to railroad companies, and, at the same time, obviate the necessity of purchasing checks by the million.

The following, from S. E. Mayo, Esq., General Ticket Agent of the Albany & Susquehanna Railway—a gentleman who has given the checking of baggage a most careful, practical consideration—is but one from nearly forty representatives of the best-managed roads in the country in reference to its incomparable value both as a local and through check:

"In reference to the Thomas Safety Railroad Baggage-Check, it has no equal; and, if I were not thoroughly convinced by personal experience, that it merits all and more than is claimed for it, I would not speak so highly in its favor. As you are aware, we have recently added a large number of new through tickets to our stock—with the Erie Railway, alone, some 38 different forms. With the old style of checking baggage, I should have been compelled to buy not less than 3,800 checks for those 38 stations, which is obviated by the Thomas system of checking baggage. Instead of covering the whole side of my baggage-room with 3,800 different forms of baggage-checks, I simply add 38 forms of station-cards to my collection, in a thirty-inch case, alongside of which are my brass checks for any station designated by card. Another great advantage possessed by this check over the old style, is, if we should discontinue our connection with any route, the Thomas Check is not lost or become useless, as is the case with the old style of checking baggage, but with the cards, they at once become available elsewhere. Experience daily convinces me that the Thomas Check is the only economical, systematic and safe check in use, and that it will not be possible much longer for its opposers to close their eyes upon its many great advantages over all other checks and systems of checking baggage, and it must ultimately commend itself to any and all who are not too prejudiced to give it a fair trial. I therefore recommend it with perfect confidence to all railroad companies as the best baggage-check in use, for both local and through travel."

HENRY STEFFEE, Esq., G. T. A. of the Louisville, Cincinnati & Lexington Railroad, says:

G. F. THOMAS, Esq., 90, 92 and 94 Grand Street, New York:  
DEAR SIR: It is with much pleasure that I am able to inform you that our baggage-men consider the Thomas Improved Safety Baggage-Check unequalled. They inform me that it facilitates the checking of baggage wonderfully, in consequence of being able to send, with any check, a piece of baggage from any station to any station, and not being compelled to spend several minutes in looking for a particular check for a certain station. In the use of your check, they save from one-half to two-thirds of the time required to check baggage by the old style of check, and with much more certainty. To stock our road so perfectly with the old style of check as we have with yours, would require, at the least calculation,五十 times the number of checks, which, in place of simplifying, complicates the checking of baggage; your check obviates all this complexity, and so simplifies the business—that it is impossible to make a mistake, unless through gross negligence or incompetency. Previous to the introduction of the Thomas Check, in consequence of the great expense, no road would even think of bringing the checking of baggage to such a state of perfection as yours does, it requiring such large quantities of brass checks to do the business as it ought to be done, which is the reason such a great number of railroads, even to this day, adhere to the old English style of packing and chalking baggage. I am satisfied that, if the officers of all the railroads were as well acquainted with the superiority of your check in every respect as are the officers of those roads upon which it is in use, it would be universally adopted, both as a local and through check, not only on account of its accuracy, economy and certainty, but also in consequence of its unequalled advantages in facilitating and simplifying the whole baggage business.

S. SCHUCH, Esq., Superintendent of the Morris & Essex Railroad, says:

"We have used the Thomas Safety Baggage Check on our road over two years, during which time we have never lost a piece of baggage to which it was attached, but, on the contrary, the baggage in every instance arrives at its place of destination with unerring certainty. We do, therefore, without the least hesitancy, recommend its use to any railroad company, being fully satisfied, after the most thorough trial, that, for a safe, reliable railroad baggage check, it has no equal, and, were it at the time in use upon every road in the country, the checking of baggage would not only be reduced to a perfect system, but would also be the means of saving railroad companies fully one-half of the present cost of conducting the baggage business."

JAMES M. WHITE, Esq., Train Master of the Central Railroad of Georgia, says:

"We are much pleased with the Thomas Patent Safety Baggage Check. They are just the check required by railroad companies, as they can be prepared in advance, or changed in a moment, for any station and a very small number of brass checks does the work of many. There is not the least doubt but that it will in time take the place of all other baggage checks now in use."

A. C. DAVIS, Esq., G. T. A. of the Belvidere, Delaware & Flemington Railroad, says:

"The Thomas Safety Baggage Check works to our entire satisfaction. No failure in the transmission of baggage since we commenced its use over two years ago. The baggage masters are pleased with them, and I am well satisfied they are the best baggage check in use, and better calculated to perform the various duties of both local and through business than any or all other baggage checks I have ever seen. Every check is, and has been, kept in constant use since we first commenced using them; and, so far as certainty, simplicity and economy are concerned, they have no equal."

All necessary information in reference to the Thomas Patent Safety Railroad, Steamboat and Express Baggage Check will be given by addressing

G. F. THOMAS, Editor Appleton's R'y Guide,

DO, DO, DO Grand St., New York

## THE "RED LINE!"

—RUNNING OVER THE—

**Michigan Southern and Lake Shore R. R.'s,**

—WAS THE—

FIRST LINE to CARRY FREIGHT BETWEEN the EAST and WEST,  
WITHOUT CHANGE OF CARS!

CARS RUN THROUGH TO

**NEW YORK AND BOSTON,**  
IN FOUR AND FIVE DAYS!

Contracts made at the Offices of the Line.

C. Shutter, Agent,  
247 Broadway, New York.

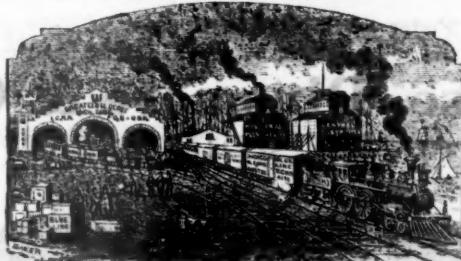
A. Cushman, Agent,  
Old State House, Boston, Mass.

W. D. MANCHESTER, Agent, 54 Clark St., Chicago.

## Great Central Route.

## "BLUE LINE."

ORGANIZED JANUARY 1, 1867.



1870.

OWNED AND OPERATED BY THE

**Michigan Central, Illinois Central, Chicago, Burlington & Quincy, Chicago & Alton, Great Western (of Canada), New York Central, Hudson River, Boston & Albany, and Providence and Worcester Railroads.**

The "BLUE LINE" is the only route that offers to shippers of freight the advantages of an unbroken gauge from Chicago to the Seaboard, and to all interior points on the line of Eastern connections beyond Suspension Bridge and Buffalo. All through freight is then transported between the most distant points of the roads in interest.

### WITHOUT CHANGE OF CARS!

The immense freight equipment of all the roads in interest is employed, as occasion requires, for the through service of this line, and has of late been largely increased. This line is now prepared to extend facilities for the transit and delivery of all kinds of freight in quicker time and in better order than ever before.

#### The Blue Line Cars

are all of a solid, uniform build, thus largely lessening the chances of delay from the use of cars of a mixed construction, and the consequent difficulty of repairs, while remote from their own roads. The blue line is operated by the railroad companies who own it, without the intervention of intermediate parties between the roads or line and the public.

Trains run through with regularity IN FOUR OR FIVE DAYS to and from New York and Boston. Especial care given to the safe and quick transport of property liable to breakage or injury, and to all perishable freight.

Claims for overcharges, loss or damage, promptly settled upon their merits. Be particular and direct all shipments to be marked and consigned via

## "BLUE LINE."

Freight contracts given at the offices of the company in Chicago, New York and Boston.

J. D. HAYES, Gen. Manager, ...Detroit.	P. K. RANDALL, ...No. 11 State St., Boston
C. E. NOBLE, ...No. 8 Astor House, N. Y.	F. A. HOWE, ...31 Dearborn St., Chicago
N. D. MUNSON, ...Quincy, Ill.	W. W. STREET, ...31 Dearborn St., Chicago
GEO. E. JARVIS, ...273 Broadway, N. Y.	J. JOHNSON, ...Cairo, Ill.

THOS. HOOPS, Gen. F'ret. Agt. Michigan Central Railroad, Chicago.  
A. WALLINGFORD, Agt. Gen. West'n R. R., No. 91 Lake St., Chicago.  
N. A. SKINNER, Freight Agent Michigan Central Railroad.

## Empire Line!

THE EMPIRE TRANSPORTATION COMPANY'S

## Fast Freight Line to the East

AND

### TO THE COAL AND OIL REGIONS,

Via Michigan Southern, Lake Shore, and Philadelphia & Erie R. R.'s,

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G. B. McCullough, ...49 South 5th St., Philadelphia. | Wm. F. Smith, ..... Erie, Penn.

JOHN WHITTAKER, Pier 14 North River, New York.

JOSEPH STOCKTON, Agent, Chicago.

W. T. HANCOCK, Contracting Agent.  
WM. F. GRIFFITHS, Jr., Gen. Freight Agent, Philadelphia.

## General Freight Department.

## The Illinois Central Railroad

ARE PREPARED TO TAKE FREIGHT FOR

**Cairo, St. Louis, Peoria,  
BLOOMINGTON, SPRINGFIELD, JACKSVILLE,**  
*And All Points in the Central and Southern parts of the State;*  
**MOBILE & NEW ORLEANS BY RAIL OR RIVER**  
*And ALL POINTS on the MISSISSIPPI below CAIRO. Also, to*  
**Freeport, Galena and Dubuque.**

Freight forwarded with promptness and despatch, and rates at all times as low as by any other route.

### BY THE COMPLETION OF THE BRIDGE AT DUNLEATH,

THEY ARE ENABLED TO TAKE FREIGHT TO ALL POINTS WEST OF DUBUQUE  
WITHOUT CHANGE OF CARS!

DELIVER FREIGHT IN CHICAGO ONLY at the FREIGHT DEPOT of the Company, foot of South Water St. Parties ordering goods from the east should have the packages marked:

### "Via Illinois Central Railroad."

FOR THROUGH BILLS OF LADING, and further information, apply to the LOCAL FREIGHT AGENT at Chicago, or to the undersigned.

M. HUGHITT, Gen. Supt.

J. F. TUCKER, Gen. Freight Agt.

J. H. LINVILLE, President.

J. L. PIPER, Gen. Manager.

A. G. SHIFFLER, Sup't & Treas.

## The Keystone Bridge Company OF PITTSBURGH, PENN.

Office and Works, 9th Ward, Pittsburgh, Pa.

Philadelphia Office, 426 Walnut Street

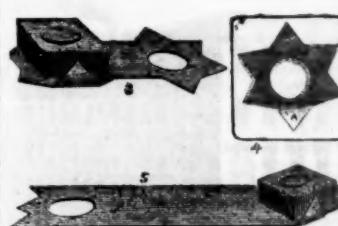
GENERAL WESTERN OFFICE:—13 Fullerton Block, 94 Dearborn St.,  
CHICAGO, ILL.

This Company possess unrivaled facilities for manufacturing and erecting every description of Iron and Wooden Railway and Road Bridges, Roofs, Turn-Tables and Buildings, "Linville and Piper" Patent Iron Bridges, Self-Sustaining Pivot Bridges, Suspension Bridges, and Ornamental Park Bridges. Contractors for wooden or iron bridges of any pattern, as per plans and specifications. Circulars sent on application.

WALTER KATTE, Engineer.

A. D. CHERRY, Secretary.

## THE UNION PATENT STOP WASHER,



Manufactured at Coatesville, Chester Co., Pa., on the line of the Pennsylvania Central R. R., has now stood the test of practical use on the above road, the Philadelphia, Wilmington & Baltimore and Philadelphia & Reading Railroads, for the past two years, and proved itself to be what is claimed for it, perfect security against the uncrowing or receding of nuts. Its simplicity, efficiency and cheapness over any other appliance for the purpose should recommend it to the attention of all persons having charge of railroad tracks, cars and machinery.

It is especially adapted to, and extensively used by leading railroads of the country for the purpose of securing nuts on railway joints.

The accompanying cuts show the application of the washer. For further information, apply to

A. GIBRONS, Coatesville, Pa.

## MANSFIELD ELASTIC FROG COMPANY



### OF CHICAGO.

AMOS T. HALL, President.

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Are now prepared to receive and promptly execute orders for RAILROAD FROGS and CROSSINGS, warranted to prove satisfactory to purchasers.

For DURABILITY, SAFETY and ELASTICITY—being a combination of Steel, Boiler Plate and Wood—they are UNEQUALED, as Certificates of Prominent Railroad Officials will testify.

The SAVING TO ROLLING STOCK AND MOTIVE POWER is at least equal to double the cost of the FROG. Orders should be addressed to

CRERAR, ADAMS & CO., Gen'l Agents,  
NO. 18 Wells Street, CHICAGO.

## LEBANON MANUFACTURING COMPANY,

LEBANON, PENNSYLVANIA,

IS PREPARED TO BUILD AT SHORT NOTICE,

## HOUSE, GONDOLA, COAL, ORE,

And all other kinds of

## CARS!

Also, IRON and Every Description of CAR CASTINGS Made to Order.

DR. C. D. GLONINGER, President.

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## CHICAGO, ROCK ISLAND & PACIFIC RAILROAD.

**THE DIRECT ROUTE FOR**  
 Joliet, Morris, Ottawa, La Salle, Peru, Henry,  
 Lacon, Peoria, Geneseo, Moline, Rock Island,  
 DAVENPORT, MUSCATINE, WASHINGTON, IOWA CITY,  
 Grinnell, Newton, Des Moines,

## COUNCIL BLUFFS & OMAHA

CONNECTING WITH TRAINS ON THE UNION PACIFIC RAILROAD, FOR

CHEYENNE, DENVER, CENTRAL CITY, OGDEN, SALT LAKE,  
 WHITE PINE, HELENA, SACRAMENTO, SAN FRANCISCO,  
 And Points in Upper and Lower California; and with Ocean Steamers at San Francisco, for all Points in  
 China, Japan, Sandwich Islands, Oregon and Alaska.

**TRAINS LEAVE** their Splendid new Depot, on VanBuren Street, Chicago, as follows:  
 PACIFIC EXPRESS, (Sunday excepted)..... 10.00 a. m. 3.25 p. m.  
 PERU ACCOMMODATION, (Sundays excepted)..... 4.30 p. m. 9.50 a. m.  
 PACIFIC EXPRESS, (Saturdays excepted)..... 11.00 p. m. [Mon. ex. 7.00 a. m.]

Elegant Palace Sleeping Cars run Through to Peoria & Council Bluffs  
 WITHOUT CHANGE!

## TICKETS TO ST. LOUIS!

FIRST CLASS, including Meals and Bests on Steamer bet. Peoria and St. Louis, \$2.00  
 SECOND CLASS, \$1.50

### AN ELEGANT PASSENGER STEAMER

Leaves Peoria every morning for St. Louis, upon arrival of Night Express, leaving Chicago daily (Saturday excepted) at 11.00 P. M., from Great Rock Island Depot, head of LaSalle St., arriving in St. Louis the following morning, connecting with morning trains leaving the city, and with steamers down the River.

Families Emigrating to Missouri or Kansas, will find this the most desirable and cheapest route, as through Freight Rates for household goods are much lower than all rail routes.

Connections at LA SALLE, with Illinois Central Railroad, North and South; at PEORIA, with Peoria, Pekin & Jacksonville Railroad, for Pekin, Virginia, &c.; at PORT BYRON JUNCTION, for Hampton, LeClaire, and Port Byron; at ROCK ISLAND, with Packets North and South on the Mississippi River.

For Through Tickets, and all desired information in regard to Rates, Routes, etc., call at the Company's Office, No. 37 South Clark Street, Chicago.

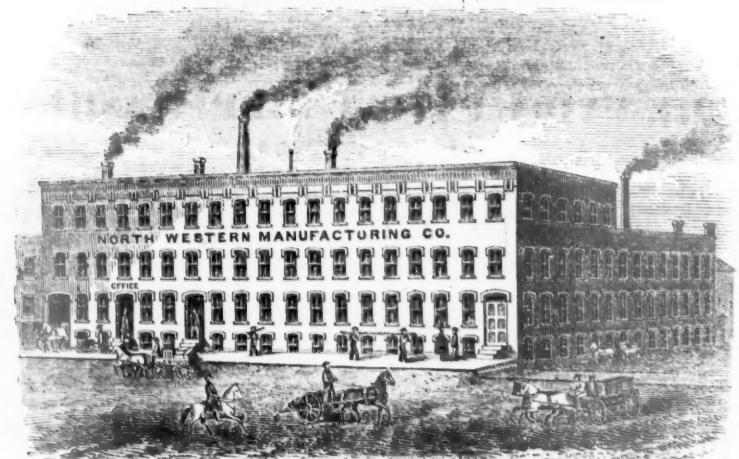
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MANUFACTURERS OF FIRST-CLASS

## Steam Engines

[HORIZONTAL AND UPRIGHT]

With Tremain's Patent Balance Valve,

Brass and Iron Goods for Steam and Gas Fitters and Engine Builders, Malleable Iron Castings, &c.

## STEAM PUMPS, AND GENERAL MACHINERY, WROUGHT IRON PIPE,

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## PATENT STEAM WARMING & VENTILATING APPARATUS,

Perfected, Simplified and adapted to Dwellings, School-houses, Churches, &c., &c.

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## PITTSBURGH CAST STEEL SPRING WORKS.

### A. French & Co.,

Manufacturers of Extra Tempered, Light Elliptic

## CAST STEEL SPRINGS, FOR RAILROAD CARS AND LOCOMOTIVES,

FROM BEST CAST STEEL.

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MANUFACTURERS OF ALL DESCRIPTIONS OF

## CAST STEEL!

BEST REFINED STEEL FOR EDGE TOOLS.

Particular attention paid to the Manufacture of

## Steel for Railroad Supplies.

### HOMOGENEOUS PLATES.

For Locomotive Boilers and Fire Boxes.

Smoke Stack Steel, Cast Steel forgings,  
 FOR CRANK PINS, CAR AXLES, &c.

Also Manufacturers of the Celebrated Brand,

## "Hussey, Wells & Co. Cast Spring Steel,"

For Elliptic Springs for Railway Cars and Locomotives.

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Volute Buffer Spring.



Group Rubber Center Spiral Spring.

VOLUTE BUFFER, INDIA RUBBER, RUBBER CENTRE SPIRAL, COMPOUND SPIRAL,  
 AND OTHER

## RAILWAY CAR SPRINGS.

No. 1 Barclay St., NEW YORK. | No. 15 La Salle St., CHICAGO.

WORKS ON 129th AND 130th STREETS, NEW YORK.

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## Superior Cast Steel Files. LANCASTER, PA.

## The National Iron Co.

[Successor to Wm. Hancock, Rough and Ready Iron Works.]

ESTABLISHED 1847.

DANVILLE, PENNSYLVANIA.

MANUFACTURER OF

## RAILROAD IRON,

RAILROAD CHAIRS, SPLICE BARS AND BOLTS, FROGS, SWITCH RODS, STANDS AND LEVERS, HOOKHEAD AND COUNTERSUNK HEAD SPIKES, BRIDGE AND CAR BOLTS, ROLLS AND ROLLING MILL MACHINERY, BLAST FURNACE CASTINGS AND MACHINERY, STEAM ENGINES AND BOILERS, IRON AND BRASS CASTINGS, ENGINE AND MACHINE WORK, STEAM & WATER FITTINGS, &c., &c.

W.M. HANCOCK, President.  
 BENJ. J. WELCH, Secy., Treas. and P. C. BRINCK, Vice-President, 401 Walnut St., Philadelphia.

# CHICAGO & NORTHWESTERN R. W.

Comprising the PRINCIPAL RAILROADS from CHICAGO Directly NORTH  
NORTH-WEST and WEST.

ALL RAIL TO THE PACIFIC OCEAN!

## Great California Line.

TRAINS LEAVE WELLS STREET DEPOT AS FOLLOWS:

8:15 A. M. Cedar Rapids Pass 11:00 P. M. Night Mail.  
10:45 A. M. Pacific Express. 11:00 P. M. R. Island Pass.  
10:45 A. M. Rock Island Exp. 4:00 P. M. Dixon Passenger.

For Fulton, Clinton, Cedar Rapids, Boone, Denison, Missouri Valley Junction, Sioux City, Council Bluffs and Omaha, there connecting with the

## UNION PACIFIC R. R.

For Cheyenne, Denver, Ogden, Salt Lake, the White Pine Silver Mines, Sacramento, San Francisco, all parts of Nebraska, Colorado, New Mexico, Arizona, Wyoming, Montana, Idaho, Utah, Nevada, and the PACIFIC COAST.

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
To OMAHA,.....	23	\$20.00	To SACRAMENTO,..	4½	\$118.00
" DENVER,.....	52	70.75	" SAN FRANCISCO, 5		118.00

TRAIN ARRIVE:—Night Mail, 7:00 a. m.; Dixon Passenger, 11:00 a. m.; Pacific Express, 3:25 p. m.; Rock Island Express, 3:25 p. m.; Cedar Rapids Passenger, 6:50 p. m.

## FREEPORT LINE.

9:00 A. M. & 9:45 P. M. For Belvidere, Rockford, Freeport, Galena, DeKalb, and St. Paul.

### 4:00 P. M., Rockford Accommodation.

5:30 P. M., Geneva and Elgin Accommodation

6:10 P. M., Lombard Accommodation.

TRAIN ARRIVE:—Freeport Passenger, 2:30 a. m.; 3:00 p. m.; Rockford Accommodation, 11:05 a. m.; Geneva and Elgin Accommodation, 8:45 a. m.; Lombard Accommodation, 6:50 a. m.

## WISCONSIN DIVISION.

Trains leave Depot, cor. West Water and Kinzie Sts., daily, Sundays excepted, as follows:—

10:00 A. M. DAY EXPRESS, for Janesville, Monroe, Whitewater, Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, and Green Bay.

3:00 P. M., Janesville Accommodation.

5:00 P. M. NIGHT EXPRESS, for Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Menasha, Appleton, Green Bay, and THE LAKE SUPERIOR COUNTRY.

5:30 P. M., Woodstock Accommodation.

TRAIN ARRIVE:—5:30 a. m., 9:00 a. m., 2:00 p. m. and 7:15 p. m.

## MILWAUKEE DIVISION.

9:45 A. M. & 5:00 P. M. EXPRESS, (except Sunday,) for Waukegan, Kenosha, Racine and Milwaukee.

MILWAUKEE ACCOMMODATION, with Sleeping Car attached..... 11:00 P. M.

EVANSTON ACCOMMODATION, (Daily,) from Waukegan Div. Depot..... 1:30 P. M.

KENOSHA ACCOMMODATION, (Sunday excepted) from Wells St. Depot..... 4:15 P. M.

AFTERNOON PASSENGER, from Milwaukee Div. Depot..... 5:00 P. M.

WAUKEGAN ACCOMMODATION, (except Sunday) from Wells St. Depot..... 5:25 P. M.

WAUKEGAN PASSENGER, (Sunday excepted) from Wells St. Depot..... 6:10 P. M.

TRAIN ARRIVE:—Night Accommodation, 8:40 a. m.; Day Express, 10:45 a. m. and 7:30 p. m.; Waukegan Accommodation, 8:40 a. m.; Day Express, 10:45 a. m. and 7:30 p. m.; Waukegan Accommodation, 8:40 a. m.; Day Express, 10:45 a. m. and 7:30 p. m.; Waukegan Passenger, 8:40 a. m.

PULLMAN PALACE CARS ON ALL NIGHT TRAINS.

THROUGH TICKETS can be purchased at all principal Railroad Offices East and South, and in Chicago at the Southeast corner of Lake and Clark Streets, and at the Passenger Stations as above.

H. P. STANWOOD, JNO. P. HORTON, GEO. L. DUNLAP,  
Gen. Ticket Agt.

## Western Union Railroad.

CHICAGO & NORTHWESTERN DEPOT, MILWAUKEE & CHICAGO DEPOT,  
CHICAGO. MILWAUKEE.

## THE DIRECT ROUTE!

CHICAGO, RACINE & MILWAUKEE,

TO

Beloit, Savanna, Clinton, Pt. Byron, Davenport, Mineral Point, Madison, Freeport, Fulton, Lyons, Rock Island, Sabula, Galena, Dubuque, Des Moines, Council Bluffs,

## OMAHA, SAN FRANCISCO

AND ALL PRINCIPAL POINTS IN

Southern and Central Wisconsin, Northern Illinois, and Central and Northern Iowa.

FRED. WILD,  
Gen. Ticket Agent.

D. A. OLIN,  
Gen. Superintendent

## CRERAR, ADAMS & CO.

MANUFACTURERS AND DEALERS IN

## Railroad Supplies!

—AND—

CONTRACTORS' MATERIAL.

11 and 13 Wells Street,  
CHICAGO, ILL.



Manufacturers of IMPROVED HEAD-LIGHTS for Locomotives, Hand and Signal Lanterns, Car and Station Lamps, Brass Dome Castings, Dome Moldings, Cylinder Heads, and Car Trimmings, of Every Description.

## Pan-Handle

AND

## Penn'a Central Route East!

SHORTEST AND QUICKEST ROUTE, VIA COLUMBUS, TO

## PITTSBURGH, BALTIMORE, PHILADELPHIA & NEW YORK

On and after Saturday, JANUARY 1st, 1870, Trains for the East will run as follows:

[DEPOT CORNER CANAL AND KIMZIE STS., WEST SIDE.]

## 6:45 A. M. NEW YORK EXPRESS.

[SUNDAYS EXCEPTED.] Arriving at

COLUMBUS ... 8:55 P. M. HARRISBURG ... 9:30 P. M. NEW YORK ... 10:26 P. M. WASHINGTON ... 1:00 P. M.  
PITTSBURGH ... 4:47 A. M. PHILADELPHIA ... 5:40 A. M. BALTIMORE ... 7:00 P. M. BOSTON ... 11:00 P. M.

## 7:45 P. M. NIGHT EXPRESS.

[SATURDAYS EXCEPTED.] Arriving at

COLUMBUS ... 11:10 A. M. HARRISBURG ... 5:30 A. M. NEW YORK ... 12:05 P. M. WASHINGTON ... 1:00 P. M.  
PITTSBURGH ... 7:05 P. M. PHILADELPHIA ... 9:40 A. M. BALTIMORE ... 9:00 A. M. BOSTON ... 11:00 P. M.

## Woodruff's Palace Day and Sleeping Cars

Run Through to COLUMBUS, and from Columbus to NEW YORK, WITHOUT CHANGE!

## ONLY ONE CHANGE TO NEW YORK, PHILADELPHIA, OR BALTIMORE!

TRY THE NEW ROUTE. FARE AS LOW AS BY OTHER LINES.

## CINCINNATI & LOUISVILLE AIR LINE SOUTH

Miles the Shortest Route to Cincinnati.

18 Miles the Shortest Route to Indianapolis and Louisville

—FROM ONE TO—

## 2 Hours the Quickest Route to Cincinnati!

THE SHORTEST AND BEST ROUTE TO

Columbus, Chillicothe, Hamilton, Wheeling, Parkersburg, Evansville, Dayton, Zanesville, Marietta, Lexington, Terre Haute, Nashville,

ALL POINTS IN CENTRAL & SOUTHERN OHIO, & INDIANA, KENTUCKY & VIRGINIA.

—QUICK, DIRECT AND ONLY ALL RAIL ROUTE TO—

## New Orleans, Memphis, Mobile, Vicksburg, Charleston, Savannah,

AND ALL POINTS SOUTH.

Cincinnati, Indianapolis and Louisville Trains run as follows:

THROUGH WITHOUT CHANGE OF CARS!

## 6:45 A. M. 7:45 P. M.

(Sundays excepted.) Arriving at

LOGANSPORT	12:10 P. M.	LOGANSPORT	12:10 P. M.
KOKOMO	1:40 P. M.	KOKOMO	2:49 A. M.
CINCINNATI	9:40 P. M.	CINCINNATI	10:00 A. M.
INDIANAPOLIS	4:30 P. M.	INDIANAPOLIS	6:00 A. M.
LOUISVILLE	11:30 A. M.	LOUISVILLE	3:30 P. M.

Lansing Accommodation: Leaves 3:45 P. M. Arrives 9:15 A. M.

## PULLMAN'S PALACE SLEEPING CARS!

Accompany all Night Trains between Chicago and Cincinnati or Indianapolis.

Ask for Tickets via COLUMBUS for the East, via HAGERSTOWN for Cincinnati, and via KOKOMO for Indianapolis, Louisville and points South. Tickets for sale and Sleeping Car Berths secured at 95 RANDOLPH STREET, CHICAGO, and at Principal Ticket Offices in the West and Northwest.

S. F. SCULL,  
Gen. Ticket Agent, Columbus.

I. S. HODSDON,  
Northwestern Pass. Agt., Chicago.

## KANSAS PACIFIC RAILWAY.

### Great Smoky Hill Route!

—TO—

## COLORADO, NEW MEXICO, ARIZONA, UTAH,

Montana, Nevada, California and Northern States of Old Mexico.

COMPLETED THROUGH KANSAS, TO

Carson, Colorado, 487 Miles West of Kansas City and Leavenworth.

Close Connections are made with Express Trains of the HANNIBAL & ST. JOSEPH and NORTH MISSOURI RAILROADS, at KANSAS CITY, and with MISSOURI PACIFIC RAILROAD at STATE LINE.

DAILY EXPRESS TRAINS are run between

KANSAS CITY, LEAVENWORTH, LAWRENCE,

Topeka, Wamego, Manhattan, Junction City, Salina, Brookville,

HARKER, HAYS and CARSON.

### Pullman's Sleeping Cars Attached to Night Express Trains!

Passenger Time from Kansas City to Denver, Less than 50 Hours.

Hughes & Co.'s Four-Horse Concord Coaches leave Carson daily for Denver, Central City, George town, &c.

Southern Overland Passenger Express and Mail Coaches leave Carson daily for Fort Lyon, Pueblo, Trinidad, Fort Union, Las Vegas, Santa Fe, &c.

Ask for Through Tickets via Kansas Pacific Railway, "Smoky Hill Route," Freight and Passage Rates as Low and Time as Quick as by any other Route.

R. B. GEMMELL, Gen. Ticket Agent.

A. ANDERSON, Gen. Supt.

THE FAVORITE THROUGH PASSENGER ROUTE !

# Chicago, Burlington & Quincy RAILROAD, AND CONNECTIONS.

**3** THROUGH EXPRESS TRAINS DAILY.

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
To OMAHA, -	- 23	\$20.00	To DENVER, -	2½	\$70.75
" ST. JOSEPH, -	21	19.50	" SACRAMENTO,	4½	118.00
" KANSAS CITY, -	22	20.00	" SAN FRANCISCO, 5		118.00

TRAINS LEAVE CHICAGO from the Great Central Depot, foot of Lake Street, as follows:

**BURLINGTON, KEOKUK, COUNCIL BLUFFS AND OMAHA.**

**7:30 A. M. MAIL AND EXPRESS**, (Daily except Sunday,) stopping at all stations between Chicago and Burlington; making close connections at Mendota with Illinois Central for Amboy, Dixon, Freeport, Galena, Dunleith, Dubuque, LaSalle, El Paso, Bloomington, &c., &c.

**10:00 A. M. PACIFIC EXPRESS**, (Daily except Sunday,) stopping only at Riverside, Hinsdale, Aurora, Leland, Mundota, Princeton, Rock Island Crossing, Buda, Kewanee, Galva, Galesburg, and Monmouth, between Chicago and Burlington. **PULLMAN PALACE DRAWING ROOM CAR** attached to this train daily from Chicago.

**TO COUNCIL BLUFFS AND OMAHA, WITHOUT CHANGE !**

**11:30 P. M. NIGHT EXPRESS**, (Daily, except Saturday,) stopping at all principal stations between Chicago and Burlington. **ELEGANT DAY COACHES**, and a **PULLMAN PALACE SLEEPING CAR** are attached to this train from Chicago to Burlington, without change! This is the only Route between

**CHICAGO, COUNCIL BLUFFS & OMAHA,**

RUNNING THE CELEBRATED

**Pullman Palace Dining Cars!**

The Shortest, Best, Quickest and only Route between  
**CHICAGO & KEOKUK,**

Without Ferrying the Mississippi River!

**QUINCY, ST. JOSEPH, LEAVENWORTH AND KANSAS CITY.**

**10:00 A. M. PACIFIC EXPRESS**, (Daily, except Sunday,) with **PALACE COACH** attached, running through from Chicago to KANSAS CITY, Without Change!

**3:30 P. M. EVENING EXPRESS**, (Daily, except Sunday,) with **PULLMAN PALACE DRAWING ROOM SLEEPING CAR** attached, running through from Chicago to QUINCY, Without Change!

**11:30 P. M. NIGHT EXPRESS**, (Daily, except Saturday,) with **PULLMAN PALACE SLEEPING CAR** attached from Chicago to GALESBURG; **PALACE DAY COACHES** from Chicago to QUINCY, Without Change!

This is the Shortest, Quickest and only Route between

**CHICAGO AND KANSAS CITY,**

WITHOUT CHANGE OF CARS OR FERRY.

THE SHORTEST, BEST AND QUICKEST ROUTE BETWEEN CHICAGO AND  
**St. Joseph, Atchison, Weston, Leavenworth,**

AND ALL POINTS ON THE KANSAS PACIFIC R.Y.

**Local Trains Leave** { **RIVERSIDE & HINSDALE ACCOM.** 1:30 & 6:00 P. M.  
**MENDOTA PASSENGER** ..... 3:30 P. M.  
**AURORA PASSENGER** ..... 5:30 P. M.

**Trains Arrive** :— Mail and Express, 3:40 p. m.; Atlantic Exp., 4:00 p. m., except Sunday; Night Exp., 6:00 a. m., except Monday; Mendota Passenger, 9:50 a. m.; Aurora Passenger, 9:35 a. m.; Riverside and Hinsdale Accommodation, 7:30 a. m. and 5:30 p. m., except Sunday.

Ask for Tickets v'n Ch'tnzo, Burlington & Quincy Railroad, which can be obtained at all principal offices of connecting roads, and at Company's office in Great Central Depot, Chicago, at as low rates as by any other route.

**ROB'T HARRIS, SAM'L POWELL,** Gen'l Ticket Agent, CHICAGO. **E. A. PARKER,** Genl. West. Pass. Agt., CHICAGO.

**PASSENGERS GOING WEST!** To Missouri, Kansas, Nebraska, Colorado or New Mexico, Should Buy Tickets via the Short Route

**HANNIBAL & ST. JOSEPH R. R. LINE.**

Three Express Trains from Quincy or Macon to St. Joseph.

— ALSO DIRECT —

**To Kansas City**

WITHOUT CHANGE OF CARS!

CONNECTIONS ARE CLOSE AND DIRECT FOR

**ATCHISON, WESTON & LEAVENWORTH.**

CONNECTIONS:

**AT KANSAS CITY**, with Kansas Pacific Railway, for Lawrence, Ottawa, Topeka, Fort Riley Junction City, Fort Hays, Sheridan, &c.

**AT KANSAS CITY**, with Kansas City, Fort Scott, and Galveston Railroad, for Fort Scott, Fort Gibson, Galveston, &c.

**AT ST. JOSEPH**, with St. Joseph & Council Bluff Railroad, ALL RAIL from St. Joseph to

**Nebraska City, Council Bluffs & Omaha.**

**AT OMAHA**, with Nebraska Union Pacific Railroad, for Fort Kearney, Julesburg, Cheyenne, Larimer, Benton, &c.

**AT COUNCIL BLUFFS**, for Sioux City, all Rail.

By this Line, passengers have choice of Overland Routes, either via Smoky Hill or Platte Route.

To Denver, Central City, Salt Lake, Sacramento, California and all points in the Mining Regions.

Daily Overland Coaches via Smoky Hill Route leave Sheridan, end of U. P. R. R., for Santa Fe and New Mexico

Through Tickets for Sale at all Ticket Offices.

**P. B. GROAT**, Gen. Ticket Agent. **GEO. H. NETTLETON**, Gen. Supt.

**HENRY STARRING**, Gen. Agent, Chicago.

Old, Reliable, Air-Line Route!

# CHICAGO, ALTON & ST. LOUIS R. R.

**SHORTEST, QUICKEST AND ONLY DIRECT ROAD TO**  
**BLOOMINGTON, SPRINGFIELD, JACKSONVILLE, ALTON,**

— AND —

**ST. LOUIS !**

WITHOUT CHANGE OF CARS.

THE ONLY ROAD MAKING IMMEDIATE CONNECTIONS AT ST. LOUIS,  
WITH MORNING AND EVENING TRAINS

— FOR —

**ATCHISON, LEAVENWORTH, KANSAS CITY,**

Lawrence, Topeka, Memphis, New Orleans,

And All Points South and Southwest.

TRAINs leave Chicago from the West-side Union Depot, near Madison Street Bridge.

EXPRESS MAIL, [Except Sundays]. . . . .	10:00 A. M.
LIGHTNING EXPRESS, [Except Saturdays and Sundays]. . . . .	11:00 P. M.
NIGHT EXPRESS, [Except Saturdays]. . . . .	7:00 P. M.
JOLIET ACCOMMODATION, [Except Sundays]. . . . .	4:00 P. M.
JACKSONVILLE EXPRESS, [Daily]. . . . .	7:00 P. M.

Trains arrive at Chicago at 8:00 P. M., 7:00 A. M. and 12:05 P. M. Joliet Accom., 9:45 A. M.

This is the ONLY LINE Between CHICAGO & ST. LOUIS RUNNING

**Pullman's Palace Sleeping and Celebrated Dining Cars !**

BAGGAGE CHECKED THROUGH.

Through Tickets can be had at the Company's office, No. 55 Dearborn street, Chicago, or at the Depot, corner of West Madison and Canal streets, and at all principal Ticket Offices in the United States and Canada. Rates of Fare and Freights as low as by any other Route.

A. NEWMAN, Gen. Pass. Agent.

J. C. McMULLIN, Gen. Supt.

# North Missouri R. R.

PASSENGERS FOR  
**KANSAS AND THE WEST,**

ARE REMINDED THAT

THE NORTH MISSOURI R. R.

IS

**11 MILES SHORTER than any other Route!**

BETWEEN

St. Louis and Kansas City.

**15 Miles Shorter between ST. LOUIS and LEAVENWORTH**

AND

**49 MILES SHORTER TO ST. JOSEPH !**

THAN ANY OTHER LINE OUT OF ST. LOUIS.

Three Through Express Trains Daily!

Pullman's Celebrated Palace Sleeping Cars on all Night Trains!

FOR TICKETS, apply at all Railroad Ticket Offices, and see that you get your Tickets via St. Louis and North Missouri Railroad.

C. N. PRATT,  
Gen. Pass. Agt., 111 Dearborn st.

J. M. DAVIES,  
General Passenger Agent,  
ST. LOUIS.

S. H. KNIGHT,  
General Superintendent,  
ST. LOUIS.

# Pacific Railroad of Missouri.

THE MOST DIRECT AND RELIABLE ROUTE FROM ST. LOUIS THROUGH TO

**KANSAS CITY, LEAVENWORTH & ATCHISON,**

WITHOUT CHANGE OF CARS!

Close Connections at KANSAS CITY with Missouri Valley, Missouri River, Ft. Scott & Gulf, and Kansas Pacific R.Y.'s, for Weston, St. Joseph, Junction City, Fort Scott, Lawrence, Topeka, Sheridan, Denver, Fort Union, Santa Fe, and

Quincy, Bolivar, Springfield, Clinton, Osceola, Lamar, Carthage, Granby, Neosho, Baxter Springs, Fort Gibson, Fort Smith, Van Buren, Fayetteville, Bentonville.

ALL POINTS WEST!

At SEDALIA, WARRENSBURG and PLEASANT HILL, with Stage Lines for Warsaw, Quincy, Bolivar, Springfield, Clinton, Osceola, Lamar, Carthage, Granby, Neosho, Baxter Springs, Fort Gibson, Fort Smith, Van Buren, Fayetteville, Bentonville.

**PALACE SLEEPING CARS on all NIGHT TRAINS.**

Baggage Checked Through Free!

THROUGH TICKETS for sale at all the Principal Railroad Offices in the United States and Canada. Be Sure and Get your Tickets over the PACIFIC R. R. OF MISSOURI.

**W. B. HALE,**  
Gen. Pass. and Ticket Agt.

**ROB'T HALE,**  
General Superintendent.

Hours the Quickest, and Sixty-One Miles the Shortest Line !

— FROM —  
CHICAGO TO NEW YORK.

# Pittsburgh, Ft. Wayne & Chicago and Pennsylvania Central

IS THE ONLY ROUTE RUNNING

THREE DAILY LINES OF THROUGH DAY AND SLEEPING CARS,

— FROM CHICAGO TO —

# Harrisburg, Philadelphia and New York,

WITHOUT CHANGE !

WITH BUT ONE CHANGE TO

BALTIMORE, PROVIDENCE, NEW HAVEN,

HARTFORD, SPRINGFIELD, WORCESTER AND BOSTON !

**Trains Leave WEST SIDE UNION DEPOT, corner West Madison and Canal Streets, as follows:**

LEAVE :	Mail.	Day Express.	Pacific Exp.	Night Exp.	VALPARAISO AC-	Commodation	South's Exp.
CHICAGO.....	4.30 A. M.	8.00 A. M.	4.45 P. M.	9.00 P. M.			
PLYMOUTH.....	9.01 "	11.25 "	s. 8.50 "	2.00 A. M.			
FORT WAYNE.....	D. 11.59 "	D. 1.55 P. M.	11.20 "	B. 6.00 "			
LIMA.....	2.25 P. M.	3.53 "	1.32 A. M.	8.30 "			
FOREST.....	3.53 "	4.49 "	2.40 "	9.40 "			
CRESTLINE.....	B. 5.50 A. M.	s. 6.30 "	4.25 "	D. 12.05 P. M.			
MANSFIELD.....	6.30 "	7.00 "	4.55 "	12.34 "			
ORRVILLE.....	9.05 "	8.52 "	6.43 "	2.27 "			
ALLIANCE.....	D. 11.15 "	10.25 "	B. 8.40 "	3.55 "			
ROCHESTER.....	9.05 P. M.	12.35 A. M.	10.52 "	6.02 "			
PITTSBURGH.....	3.50 "	2.10 "	D. 12.35 "	B. 7.49 "			
BLAIRSTOWN BRANCH.....	6.05 "	4.20 "	2.49 P. M.	9.54 "			
JOHNSTOWN.....	6.56 "	5.06 "	3.37 "	10.42 "			
CRESSON.....	7.38 "	6.08 "	4.38 "	11.43 "			
ALTOONA.....	B. 9.05 "	B. 7.15 "	B. 5.45 "	12.35 A. M.	B. 10.05 "		
HUNTINGDON.....	10.21 "	8.26 "	7.04 "	1.45 "			
LEWISTOWN.....	11.44 "	9.41 "	8.23 "	2.59 "			
HARRISBURG.....	2.10 A. M.	D 12.10 P. M.	10.45 "	5.21 "	D. 2.50 "		
LANCASTER.....	3.40 "	1.35 "	12.15 A. M.	6.42 "			
DOWNTON.....	5.00 "	2.55 "	1.40 "	B. 8.12 "			
ARRIVE :							
PHILADELPHIA.....	6.20 "	4.15 "	3.00 "	9.30 "	6.50 "		
NEW YORK, VIA PHILADELPHIA.....	10.41 "	7.43 "	6.43 "	1.00 P. M.	10.26 "		
NEW YORK, VIA ALLENTOWN.....		6.35 "		12.05 P. M.			
BALTIMORE.....		3.40 "	2.20 "	9.00 A. M.	7.00 "		
WASHINGTON.....		6.20 "	5.50 "	1.00 P. M.	10.00 "		
BOSTON.....	9.00 P. M.	5.50 A. M.	5.05 P. M.	11.50 "			

**THE DAY EXPRESS** Leaves Chicago daily, except Sunday; has SILVER PALACE CARS from Chicago to New York, via Allentown, except Saturday. This train reaches NEW YORK one and a half hours in advance of all other Lines, and in time to make close connection for BOSTON ! No other Route through New York makes it ! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes !

**THE PACIFIC EXPRESS** Leaves Chicago and Pittsburgh daily, for Philadelphia and New York, with THROUGH SILVER PALACE CARS from Chicago; leaves Harrisburg for Baltimore daily, except Sunday; has SLEEPING CARS from Chicago to Pittsburgh, and from Altoona to Philadelphia. This train arrives in NEW YORK One Hour, BALTIMORE Nine Hours, and WASHINGTON Seven Hours, in Advance of all other Lines !

**THE NIGHT EXPRESS** Leaves Chicago daily, except Saturday and Sunday; leaves Pittsburgh daily, except Sunday; leaves Harrisburg for Baltimore on Monday and Thursday from Chicago to Philadelphia and New York; has SLEEPING CARS from Chicago to Crestline, and from Pittsburgh to New York, Philadelphia and Baltimore. This train reaches NEW YORK One Hour, and BALTIMORE Three Hours in Advance of competing Routes !

**THE MAIL** Leaves Chicago daily, except Sunday, stopping at all Stations, and reaching Crestline [Express] the next morning, and leaves Pittsburgh daily, except Sunday. SLEEPING CARS from Pittsburgh to Philadelphia.

**THE SOUTHERN EXPRESS** Leaves PITTSBURGH daily, except Monday, with SILVER PALACE CARS to Philadelphia and New York; leaves Harrisburg for Baltimore daily, except Sunday.

**BOSTON AND NEW ENGLAND PASSENGERS** will find this Route especially Desirable, as it Gives them an opportunity of Seeing the FINEST VIEWS AMONG THE ALLEGHENY MOUNTAINS,

Besides Visiting PITTSBURGH, PHILADELPHIA and NEW YORK, without extra cost !

All New England Passengers holding Through Tickets, will be Transferred, with their Baggage, to Rail and Boat Connections in NEW YORK, WITHOUT CHARGE.

Close Connections Made at Lima for all Points on the Dayton & Mich. and Cin., Hamilton & Dayton R'y's,

And at CRESTLINE, for CLEVELAND, ERIE, DUNKIRK, BUFFALO, NIAGARA FALLS, and all Points reached via Lake Shore R. R.

THROUGH TICKETS FOR SALE AT THE COMPANY'S OFFICES, N.W. COR. RANDOLPH & LA SALLE ST.,

65 and 52 Clark St., Cor. Randolph and Wells St., (under the Briggs House,) and at Depot, Chicago; also at Principal Ticket Offices in the West.

F. R. MYERS, Gen. Pass. and Ticket Agt, P. & F. W. R'y, Chicago. W. C. CLEELAND, Gen. Western Pass. Agt, P. Ft. W. & C. R'y, Chicago.

T. L. KIMBALL, Gen. Western Pass. Agent, Penn. Central R. R., Chicago.

## NEW YORK AND BOSTON !

VIA

## ALLENTOWN LINE.

THE ONLY LINE

Running Through Silver Palace Cars on Morning Trains from Chicago,

Via PITTS., FT. WAYNE & CHICAGO R'Y & ALLENTOWN LINE.

TWO EXPRESS TRAINS LEAVE CHICAGO VIA ALLENTOWN LINE,

On the Arrival of Trains from the West and South, as follows :

**8:00 A. M. 9:00 P. M.**

Sat. & Sun. Excepted.

Sat. & Sun. Excepted.

PASSENGERS SHOULD SEE THAT THEIR TICKETS ARE VIA ALLENTOWN, and SAVE 60 to 100 MILES TRAVEL !

## THE SHORTEST LINE TO NEW YORK !

BAGGAGE CHECKED THROUGH !

FOR TICKETS and Information, apply at the Office, 52 Clark Street, under the Sherman House. SLEEPING CAR APARTMENTS and Time Tables furnished.

ROBERT EMMETT,  
Western Pass. Agent, 53 Clark St.,  
CHICAGO.

H. P. BALDWIN,  
General Pass. Agent, 119 Liberty St.,  
NEW YORK.

Broad Gauge ! Double Track !

## ERIE RAILWAY.

### 4 EXPRESS TRAINS DAILY !

From Cleveland, Dunkirk and Buffalo, 625 Miles, to New York, WITHOUT CHANGE of Coaches !

The Trains of this Railway are run in DIRECT CONNECTION WITH ALL WESTERN AND SOUTHERN LINES, for

Elmira, Williamsport, Oswego, Great Bend, Scranton, Newburgh,

## NEW YORK, ALBANY, BOSTON, PROVIDENCE, AND PRINCIPAL NEW ENGLAND CITIES.

New and Improved DRAWING ROOM COACHES are attached to the DAY EXPRESS RUNNING THROUGH TO NEW YORK.

**SLEEPING COACHES**, Combining all Modern Improvements, with perfect Ventilation and the peculiar arrangements for the comfort of Passengers incident to the BROAD GAUGE, accompany all night trains to New York.

**CONNECTIONS CERTAIN** ! as Trains on this Railway will, when necessary, wait from one to two hours for Western trains.

All Trains of Saturday run directly Through to New York.

Ask for Tickets via Erie Railway, which can be procured at 66 Clark Street, Chicago, and at all Principal Ticket offices in the West and Southwest.

L. D. RUCKER, A. J. DAY, WM. R. BARR,  
Gen'l Superintendent, New York. | Western Passenger Agent, Chicago. | Gen'l Passenger Agent, New York

**LAKE SHORE  
— AND —  
MICHIGAN SOUTHERN R.W.  
THE GREAT THROUGH LINE BETWEEN  
CHICAGO, BUFFALO & NEW YORK,  
WITHOUT CHANGE!  
AND THE ONLY RAILWAY  
RUNNING PALACE COACHES THROUGH!  
— BETWEEN —  
CHICAGO & NEW YORK, via BUFFALO  
WITHOUT TRANSFER OF PASSENGERS!**

All Trains Stop at Twenty-Second Street to Take and Leave Passengers.  
Baggage Checked at that Station for all Points East.

**4 EXPRESS TRAINS DAILY,** [Sundays Excepted,] Leave Chicago from the New Depot, on Van Buren St., at the head of La Salle Street, as follows

**6:00 A.M. MAIL TRAIN.**

VIA OLD ROAD. SUNDAYS EXCEPTED.

Leaves 22d Street 6:15 A. M. Stops at all Stations. Arrives—Toledo, 4:40 P. M.

**8:00 A.M. SPECIAL NEW YORK EXPRESS**

VIA OLD ROAD. SUNDAYS EXCEPTED.

Leaves—Twenty-Second Street, 8:15 A. M. Arrives—Elkhart, 11:50 A. M. (Stops 20 minutes for Dinner); connects with **Air Line Mail Train**, leaving Elkhart, 12:01 P. M., stopping at all Stations on Air Line Division between Elkhart and Toledo, connecting at Toledo with **Special New York Express** 5:10 P. M.; arrives at Cleveland, 9:20 P. M.; Buffalo, 3:40 A. M.; New York, 8:00 P. M.; Boston, 11:45 P. M.

This Train has **PALACE SLEEPING COACH** Attached, Running  
THROUGH TO ROCHESTER, WITHOUT CHANGE!

IN DIRECT CONNECTION WITH

Wagner's Celebrated Drawing-Room Coaches on N. Y. Central R. R.

**4:45 P.M. ATLANTIC EXPRESS** (Daily),

VIA AIR LINE.

Leaves—Twenty-Second Street, 5:00 P. M. Arrives—Laporte, 7:25 P. M. (Stops 20 minutes for Supper); arrives at Toledo, 2:30 A. M.; Cleveland, 7:15 A. M. (20 minutes for Breakfast); arrives at Buffalo, 1:50 P. M.; Rochester, 5:10 P. M. (20 minutes for Supper); connects with **Sleeping Coach running Through from Rochester to Boston Without Change**, making but One Change between Chicago and Boston.

NEW AND ELEGANT SLEEPING COACH Attached to this Train, Running  
THROUGH from CHICAGO TO NEW YORK WITHOUT CHANGE! Arrives  
at NEW YORK, 7:00 A. M.

**9:00 P.M. NIGHT EXPRESS**

VIA OLD ROAD. (DAILY EXCEPT SAT. & SUN.)

Leaves—Twenty-Second Street, 9:12 P. M. Arrives—Toledo, 6:35 A. M. (20 minutes for Breakfast); arrives at Cleveland, 11:20 A. M.; Buffalo, 6:30 P. M.; New York, 1:00 P. M.; Boston, 3:50 P. M.

**KALAMAZOO DIVISION.**

Leave Chicago 8:00 A. M. Arrive at Kalamazoo 3:15 P. M.; Grand Rapids, 6:30 P. M.

Leave Chicago 9:00 P. M. Arrive at Kalamazoo 4:40 A. M.; Grand Rapids, 8:15 A. M.

There being no heavy grades to overcome, or mountains to cross, the road bed and track being the smoothest and most perfect of any railway in the United States, this Company run their trains at a high rate of speed with perfect safety.

Travelers who wish to SAVE TIME and make SURE CONNECTIONS, purchase Tickets via

**LAKE SHORE & MICHIGAN SOUTHERN R.Y.**

THE ONLY LINE RUNNING THROUGH BETWEEN CHICAGO AND BUFFALO, WITHOUT TRANSFER, and in Direct Connection with NEW YORK CENTRAL RAILROAD and ERIE RAILWAY.

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General Superintendent, CLEVELAND, OHIO.

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General Western Passenger Agent, CHICAGO.

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PASSENGER TRAINS LEAVE CHICAGO FROM THE GREAT CENTRAL DEPOT, FOOT OF LAKE ST

**ST. LOUIS AND CHICAGO THROUGH LINE.**

**8:30 A.M. DAY EXPRESS,** Sundays Excepted  
Arriving in ST. LOUIS at 9:30 P. M.

This Train Reaches St. Louis ONE HOUR & FIFTEEN MINUTES in Advance of any other Route!

**9:30 P.M. FAST LINE.** Saturdays Excepted.  
Arriving at ST. LOUIS at 10:30 A. M.

AT ST. LOUIS, Direct Connections are Made FOR

Jefferson City, Sedalia, Pleasant Hill, Macon, Kansas City,  
**LEAVENWORTH, ST. JOSEPH & ATCHISON,**

Connecting at KANSAS CITY for—

LAWRENCE, TOPEKA, JUNCTION CITY, SALINA, SHERIDAN, &c.

**CAIRO, MEMPHIS AND NEW ORLEANS LINE.**

**8:30 A.M. CAIRO MAIL,** Sundays Excepted.  
Arriving at Cairo 2:20 A. M., Memphis 12:40 P. M., Mobile 9:40 A. M., Vicksburg 9:30 A. M., New Orleans 11:10 A. M.

**9:30 P.M. CAIRO EXPRESS,** Except Saturdays.  
Arriving at Cairo 3:15 P. M., Memphis 2:30 A. M., Vicksburg 5:00 P. M., New Orleans 1:30 A. M.

**4:50 P.M. CHAMPAIGN PASSENGER,**  
Arriving at Champaign at 11:00 P. M.

THIS IS THE ONLY DIRECT ROUTE TO

Humboldt, Corinth, Grand Junction, Little Rock, Selma, Canton, Grenada, Columbus, Meridian, Enterprise,

**MEMPHIS, VICKSBURG, NEW ORLEANS & MOBILE.**

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And all Parts of Texas.

NOTICE.—This Route is from 100 to 150 MILES SHORTER, and from 12 to 24 HOURS QUICKER than any other.

THIS IS ALSO THE ONLY DIRECT ROUTE TO  
**DECATUR, TERRE HAUTE, VINCENNES & EVANSVILLE.**

**Peoria and Keokuk Line.**

**8:30 A.M. KEOKUK PASSENGER,** Sun. Ex.  
Arriving at Chenoa 8:15 P. M., El Paso 4:05 P. M., Peoria 5:40 P. M., Canton 7:14 P. M., Bushnell 8:59 P. M., Keokuk 11:36 P. M., Warsaw 12:05 A. M.

**9:30 P.M. KEOKUK PASSENGER,**  
On Saturdays, this Train will leave at 4:50 P. M. Arriving at Chenoa 9:35 A. M., El Paso 4:25 A. M., Peoria 6:05 A. M., Canton 7:36 A. M., Bushnell 9:25 A. M., Keokuk 12:05 P. M., Warsaw 12:40 P. M.

THIS IS THE DIRECT ROUTE TO

**PEORIA, CANTON, KEOKUK, CHATSWORTH, FAIRBURY,  
CHENOEA, EL PASO, BUSHNELL, HAMILTON, & WARSAW.**

Connecting at PEORIA for

**PEKIN, HAVANA, BATH AND VIRGINIA.**

CONNECTING AT KEOKUK FOR—

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For Through Tickets, Sleeping Car Berths, Baggage Checks, and information, apply at the office of the Company in the Great Central Depot, foot of Lake St.

**Hyde Park and Oakwoods Train.**

HYDE PARK TRAIN...	LEAVE...	ARRIVE...	HYDE PARK TRAIN...	LEAVE...	ARRIVE...
	*6:30 A. M.	*7:45 A. M.		*7:00 P. M.	*8:15 P. M.
	8:05 A. M.	9:13 A. M.		8:10 P. M.	9:35 P. M.

\* Sundays Excepted.

W. P. JOHNSON, Gen. Pass. Agent.

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The Great Central Route, via Niagara Falls, to

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— FROM —

CHICAGO TO NEW YORK CITY, WITHOUT CHANGE.

**4 PASSENGER TRAINS LEAVE CHICAGO, DAILY EXCEPT SUNDAY.**  
(DEPOT, FOOT OF LAKE STREET,) as follows:

**5:00 A. M. MAIL TRAIN.** Stops at all Stations.  
(SUNDAYS EXCEPTED.) Arrives DETROIT at 5:50 P. M.

**8:00 A. M. SPECIAL NEW YORK & BOSTON EXP.**  
(SUNDAYS EXCEPTED.) Arrives at Michigan City 10:12, New Buffalo 10:30, Niles 11:25, Kalamazoo 1:00 P. M.; Battle Creek 1:45, Marshall 2:15, (Dinner), Jackson 3:40, Detroit 6:20, London 11:15, Hamilton 2:00 A. M.; Toronto 9:20, Suspension Bridge 3:25, Rochester 6:50 A. M.; Albany, 2:40 P. M.; NEW YORK, 7:30, BOSTON, 11:50 P. M. This train connects at ROCHESTER (7:00 A. M.) with

**Wagner's Magnificent Palace Drawing-Room Cars!**  
RUNNING THROUGH TO NEW YORK, WITHOUT CHANGE!

**4:45 P. M. ATLANTIC EXPRESS.**  
(DAILY.) Arrives at Michigan City, 7:00 P. M.; Niles 8:15 P. M. [Supper]; Kalamazoo, 10:25 P. M.; Jackson, 1:00 A. M.; Detroit 3:40, London, 8:35, [Breakfast]; Hamilton 11:30, Suspension Bridge 1:30 P. M.; Rochester 5:10 P. M.; Albany, 1:50 A. M.; NEW YORK, 7:00 A. M.; BOSTON, 11:00 A. M.

A MAGNIFICENT DRAWING-ROOM SLEEPING CAR is attached to this train daily, FROM CHICAGO TO NEW YORK CITY. The celebrated

Hotel Drawing-Room Car is also attached to this Train from Chicago to Rochester!

These, together with ELEGANT DAY CARS TO SUSPENSION BRIDGE, make this Train the favorite Train for all points East.

**SPECIAL NOTICE.**—Boston and New England Passengers will please notice that this Train now makes direct connection through. A SLEEPING CAR is attached at Rochester at 5:30 P. M., running through to Springfield, Mass., thus avoiding transfer at Albany. Breakfast at Springfield. This Train reaches Springfield early enough second morning to Connect with all Trains up and down the Connecticut.

**9:00 P. M. NIGHT EXPRESS.**  
(SAT. & SUN. EXCEPTED.) Arrives at Michigan City, 11:15 P. M.; Niles, 12:45 A. M.; Kalamazoo, 2:25; Marshall, 3:45; Jackson, 5:10; Grand Trunk Junction, 8:05; Detroit, 8:20; London, 1:45 P. M.; Hamilton, 4:35; Toronto, 9:35; Niagara Falls, 6:15; Buffalo, 7:15 P. M.; Rochester, 9:10; Syracuse, 12:35 A. M.; Rome, 1:55; Utica, 2:35; Albany, 6:30 A. M.; NEW YORK, 12:45 P. M.; BOSTON, 3:40 P. M.

**PULLMAN'S PALACE SLEEPING CARS ARE ATTACHED TO THIS TRAIN FROM CHICAGO TO DETROIT,**  
And from Suspension Bridge to New York.

WE INVITE THE ATTENTION OF THE TRAVELER to the SPLENDID EQUIPMENTS of this FIRST-CLASS LINE TO THE EAST!

FOR THROUGH TICKETS, and any and all information, Sleeping Car accommodations, &c., apply at General Office in Tremont House Block, at office in Great Central Depot; also at No. 60 Clark street, under Sherman House; at Grand Trunk Railway Office, 48 Clark street, or at New York Central Railroad Office, No. 53 Clark street, and at office under Briggs House.

H. E. SARGENT, Gen. Supt. M. C. R. R.

W. K. MUIR, Gen. Supt. Gt. Western R. W.

HENRY C. WENTWORTH, Gen. Pass. Agt.

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VIA MICHIGAN CENTRAL RAILROAD.

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**8:00 A. M. MORNING EXPRESS.**  
(EXCEPT SUNDAY.) Arriving at LaFayette, 2:25 P. M.; Indianapolis, 6:00 P. M.; Louisville, 11:30 P. M.

**4:00 P. M. AFTERNOON EXPRESS.**  
(EXCEPT SATURDAY) Arriving at Michigan City 6:30 P. M. [Supper]; LaFayette, 11:30 P. M.; Indianapolis, 2:15 A. M.; Louisville, 7:00 A. M.; Nashville, 4:00 P. M.

A GOOD SLEEPING CAR is Attached to this Train Every Night,  
And goes from Chicago to Louisville WITHOUT CHANGE!

**SPECIAL NOTICE.**—This Train stops at Michigan City for Supper, and waits at that point for Michigan Central Atlantic Express East, leaving Chicago at 4:45 p. m. Passengers going South, and wishing as much time in Chicago as possible, can take the 4:45 p. m. Michigan Central Atlantic Express, and connect without fail at Michigan City, with above Through Louisville Express.

THE GREAT BRIDGE ACROSS THE OHIO at Louisville being completed, passengers are relieved of the omnibus transfer.

FOR THROUGH TICKETS, via this line, apply at offices of connecting lines and at all ticket offices in Chicago.

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**Chicago & Michigan Lake Shore Railroad.**

Open from New Buffalo to St. Joseph, Mich.

**8:00 A. M. AND 4:00 P. M.** Trains from Chicago Connect at New Buffalo.

**Kalamazoo, Allegan & Grand Rapids R. R.**

Open to Grand Rapids.

**8:00 A. M. AND 9:00 P. M.** Trains from Chicago Connect at Kalamazoo.

**Peninsular Railroad of Michigan.**

Open to Charlotte.

**8:00 A. M. AND 9:00 P. M.** Trains from Chicago Connect at Battle Creek.

**Jackson, Lansing & Saginaw Railroad.**

Open to Bay City, Mich. Passing through Lansing and Saginaw.

**8:00 A. M. AND 9:00 P. M.** Trains from Chicago Connect at Jackson.

**GRAND TRUNK RAILWAY.**

All Michigan Central Trains Connect at Grand Trunk Junction

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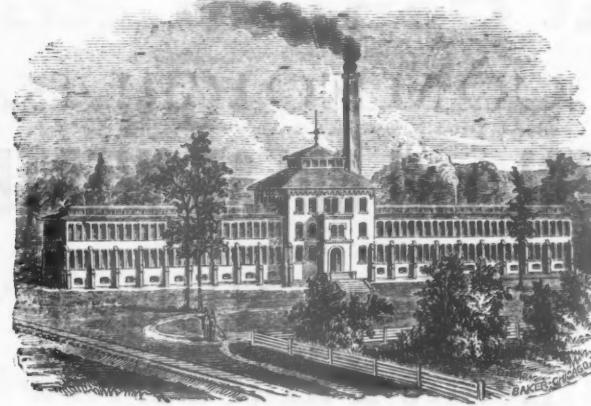
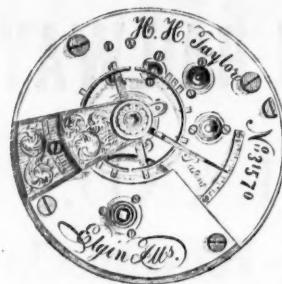
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H. E. SARCENT, General Superintendent.

# Elgin Watches!



# Elgin Watches!



MANUFACTURED BY

## THE NATIONAL WATCH COMP'Y.

OFFICE GEN'L SUP'T U. P. R. R. }  
OMAHA, Neb., Dec. 16, 1869. }  
HON. T. M. AVERY, President National Watch Co., Chicago, Ill.

Dear Sir—During the months that I have carried one of your B. W. Raymond Watches, it has not failed to keep the time with so much accuracy as to leave nothing to desire in this regard.

For accuracy in time keeping, beauty of movement and finish, your watches challenge my admiration and arouse my pride as an American, and I am confident that in all respects they will compete successfully in the markets of the world with similar manufactures of olden-times. They need only to be known to be appreciated.

Yours, most respectfully,

C. G. HAMMOND, Gen. Supt.

OFFICE OF GEN'L SUP'T II. R. R. R. }  
NEW YORK, Jan. 17, 1870. }

M. AVERY, Esq., President National Watch Co.

Dear Sir.—The Watch made by your Company, which I have carried the past two months, has kept excellent time. I have carried it frequently on engines, and have been on the road with it almost daily. During this time it has run uniformly with our standard clock. Truly yours,

J. M. TOUCY.

No Movements Retailed by the Company.

PENN'S R. R. CO., GEN. SUP'T, OFFICE, }  
ALTOONA, Jan. 19, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago:

Dear Sir—This Company has purchased and put in the hands of its eight-men, eighty "Raymond movements," which have given excellent satisfaction and proved to be very reliable time-keepers. In addition to these, quite a number of Elgin Watches have been purchased by officers and employes of this Company, all of whom have been well pleased with the efficiency and regularity of the movements manufactured by the National Watch Company. Respectfully,

EDWARD H. WILLIAMS,  
General Superintendent.

AMERICAN MERCHANTS' UNION EXPRESS CO., }  
CHICAGO, Feb. 17, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago, Ill.

Dear Sir—it gives me pleasure to state that the two or three Elgin Watches I have at different times purchased for presentation have given entire satisfaction, and are highly valued as elegant and correct time-keepers.

A very large number of your Watches are being carried by the Messengers in the employ of this Company, and are giving entire satisfaction, their time-keeping qualities being implicitly relied upon.

CHAS. FARGO.

Yours, truly,

MICHIGAN CENTRAL R. R. CO. }  
CHICAGO, Jan. 15, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have now been carrying one of your Elgin Watches, of the B. W. Raymond pattern, for nearly five months, and it affords me much pleasure to testify in favor of its time-keeping qualities, in which, after this length of time, I have great confidence. It has from the first run very close to the standard time, the slight variation being uniform, and susceptible of correction by careful regulation. My experience thus far justifies the opinion that it is a very safe and reliable time-keeper.

Respectfully yours, H. E. SARGENT.

OFFICE OF THE GEN. SUP'T. C. & N. W. R. Y. }  
CHICAGO, Feb. 16, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have pleasure in expressing my opinion of the Elgin Watches, the more so since I do not think there is a better watch made. A large number of them are in use by our conductors and engineers, and other employes, and I have heard no dissenting opinion upon their merits. They run with a smoothness and uniformity fully equal to any other watch I know of, and justify all your claims of excellence in manufacture and fitting of parts. Yours, truly,

GEO. L. DUNLAP, Gen'l Sup't.

LAKE SHORE & MICHIGAN SOUTHERN R. R. }  
CHICAGO, Jan. 27, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have carried the Elgin Watch long enough to be able to pronounce it a first-rate time-keeper. I am making a very careful test of its performance and will soon give you the results. I think it will show that the West can produce Watches equal to those of the manufacture of any part of the world. Yours, truly,

E. B. PHILLIPS.

President L. S. & M. R. R. Co.

OFFICE GEN. SUP'T. ERIE RAILWAY, }  
NEW YORK, Feb. 7, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago, Ill.:

Dear Sir—Having for about three months tested, in various ways, the "time-keeping" qualities of one of your Elgin Watches, I most cheerfully award it the praise that it is due. For one month the Watch was carried by one of our Locomotive Engineers, and since by different persons, so that its full value as a time-keeper could be known under different modes of treatment. I will simply say that it has given perfect satisfaction, and in my opinion is as near perfection as I believe it possible a Watch can be made.

Respectfully yours, L. H. RUCKER,

General Superintendent.

Business Office and Salesroom of the National Watch Company, Nos. 159 and 161 Lake Street, Chicago.

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